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Morning Prayer

THE day returns and brings us the petty round of irritating concerns and duties. Help us to play the man, help us to perform them with laughter and kind faces, let cheerfulness abound with industry. Give us to go blithely on our business all this day, bring us to our resting beds weary and content and undishonored, and grant us in the end the gift of sleep. Amen.

—ROBERT LOUIS STEVENSON.

J. G. ADAMS, L. D. S.,

TORONTO.

DR. ADAMS was an early pioneer in Public Oral Hygiene Propaganda in Canada, and carried on an active campaign for school dental inspection many years before the question was taken up officially by the dental profession. Twenty years ago Dr. Adams' ideas were considered Utopian, but he has lived to see practically his entire programme put into effect in many municipalities. Dr. Adams is honored by his colleagues because of the great service he has rendered humanity and the heavy personal sacrifices he has made.—EDITOR.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, JANUARY, 1920 No. 1

Dentistry During the Past Decade

By F. J. Conboy, D.D.S., Toronto.

Provincial Dental Officer, Department of Education, Ontario.

THIS being the first number of the tenth volume of ORAL HEALTH, it has been thought opportune to review some of the great developments made in dentistry during the past decade. The world war has taught the profession many lessons, and has opened up new fields of usefulness and service. Recent research and investigations have proven that many of our former practices resulted disastrously to the health of our patients, and we are now no longer the calm, self-satisfied practitioners that we formerly were. The discovery that a very large percentage of our root canal treatments were unsuccessful, and that areas of infection developing at the apices of these roots were the cause of serious systemic disorders, has emphasized the urgent need for means of preventing tooth decay, and for a system whereby defects may be discovered and corrected before the dental pulp becomes involved. The ravages of Periclasia have demonstrated the need of a practical method of recognizing the premonitory symptoms of this disease and combating it at an early stage in its development. The growing conviction that the operator cannot be absolutely certain of the success of his root canal work, and that under a proper system of inspection and treatment there would be less need for devitilization, has given great impetus to the Oral Hygiene and School Dentistry movements.

The Oral Hygiene movement has not only made great progress within the profession, but physicians, educationalists, and the thinking public generally, now recognize the great value of preventive dentistry, and are demanding—and rightly so—that the profession render such a service as will protect them from the baneful results of dental disease. No longer is the intelligent patient satisfied to have his ruined teeth patched up, but he is seeking that treatment which will preserve for him healthy and efficient masticating organs and a mouth that is clean and free from infection. The solution is simple and practicable. It consists in regular inspection and immediate treatment, with proper instruction and supervision in oral cleanliness, mastication and diet. For children of school and pre-school age, this inspection and supervision should be conducted at the school, the parents bringing the smaller children at an appointed time, and securing advice in regard to the ways and means whereby the home may co-operate with the school in the care of the children's teeth. Those who can afford it will have the family dentist perform the necessary operations, while school dental clinics provide treatment for the remainder. Such a system would mean that during school days habits of cleanliness would be established which would become permanent. Deciduous and permanent teeth would be preserved, food values would be recognized, and the importance of proper mastication realized; in short, the causes of nearly all diseases incident to child life would be eliminated.

In no country has the need for an improved dental service been so clearly recognized by the authorities as in Great Britain. The examinations for military enlistment revealed the fact that the mouths of the people were in a deplorable condition, and that the health of the nation had suffered as a result. When the dentists were called up for military service it became apparent that the number of qualified dentists in Great Britain was totally inadequate for the needs of the civilian population, apart from the army and navy. The acuteness of the situation forced the Government to appoint a Royal Commission to conduct an inquiry into the whole matter. This Commission heard evidence from all those interested in public health, and after a careful survey of the question from every angle, presented a very valuable report, containing, among many others, the following recommendations:

SECTION XXIV.—EDUCATION OF THE PUBLIC IN THE NEED FOR DENTAL TREATMENT.

226. We have had the most striking unanimity in all the evidence we have heard from both registered and unregistered practitioners as to the failure of the population to regard dental disease and its effect on health as in any way a serious matter. The idea that the teeth are a portion of the human body which when they are diseased need treatment is quite foreign to all accepted notions. Disease is allowed to progress until it becomes incurable and the teeth have to be removed. Again and again we have had evidence that people will not

bother to have their teeth stopped when disease first appears, but let them rot and decay until pain drives them to the dentist for extractions. The responsibility for this has largely rested with parents in the past, as they have exercised practically no oversight over the health of their children's teeth. During the last 10 years various organizations have been established through which in our opinion it may be possible to affect very materially the health of the nation by a properly directed educational propaganda designed to impress upon people the importance of looking after their own and their children's teeth.

227. *Health Visitors.*—Health visitors might be instructed in the evil results to health which follow in the train of neglected teeth. At her visits to the homes of children a health visitor has a unique opportunity of impressing on mothers the grave injury resulting from neglect of decayed teeth. Carefully worded leaflets, preferably illustrated, might be distributed. Advice is much more likely to be followed if there exist in the district dental services (maternity, school, and general) at which treatment can be obtained.

228. *School Agencies.*—Opportunities exist in great measure in the school services for extremely useful educational propaganda work. The teachers, attendance officers, school nurses, and the school dentists themselves can all do most useful work in educating the public and the children on the subject.

229. *Welfare Supervisors.*—Women suffer more from decayed teeth than men, and welfare supervisors have it in their power to persuade many girls and young women to have their teeth attended to. They will have the satisfaction of knowing that they are saving many women years of chronic ill health and suffering in later life.

230. *Insurance Societies.*—In their own pecuniary interest quite as much as in that of their members, insurance societies should neglect no opportunity of impressing the importance of a healthy set of teeth and the evil results following neglect. From the evidence submitted to us it is clear that a society that took effective steps to ensure that the teeth of its members were properly attended to on admission to the society and, when needed, afterwards would experience the benefit resulting from the improved average standard of health which its members would enjoy. As far as we are in position to see there is no one factor within the control of insurance societies which will repay them so well as to concentrate on the teeth of their members. The health insurance organizations of different kinds by advocating locally the establishment of public dental services will be aiding the creation of machinery by which sickness will be diminished. When a dental service is set up an insurance society should never neglect to advise its members to avail themselves of its use. Perhaps of all bodies insurance societies have most to gain by the establishment of efficient dental services.

231. *School Dental Certificates.*—We wish to suggest that in a few years, when school dental treatment of children leaving school is in effective operation, and public dental services are in existence, the question of school dental certificates be considered.

Such certificates might be of great practical use, and be made the basis of a definite continuous oversight of the health of the teeth of the people. Labor exchanges, employers of labor, insurance societies, doctors, or anyone who was interested in preserving the health of an individual, would have available the means of bringing home to that individual the importance of teeth preservation.

232. *Medical Practitioners.*—It is the professional duty of a doctor to do everything within his skill for his patient. We have had suggestions that doctors sometimes have failed to impress upon their patents the importance of going to a dentist when this is an essential part of the permanent cure of his illness. We were informed by Sir Donald Macalister that it is becoming more frequent for doctors to advise such preventive treatment than it used to be. We wish to recall to the medical profession the great opportunities which frequently come their way of advising with authority the necessity of preventive dental treatment.

233. *A Public Dental Service.*—Perhaps the best educator of the public in dental matters is an efficient dental clinic. The presence of the means of treatment, always available, produces a definite effect on the public. The preventive side of dental treatment becomes emphasized directly a public authority considers it its duty to provide treatment. The instruction and advice given at such a clinic spreads throughout the area served, and knowledge of the ill effects of teeth neglect replaces ignorance. In a town properly served with a live dental clinic any inhabitant noticing the onset of dental decay would know it was to his interest to have it at once attended to.

234. *The Press.*—It is strange that, whereas articles in the public press frequently deal with disease and its prevention, and instruct the public in adequate measures of precaution, it is rare indeed to find the importance from a health point of view of the preservation of the teeth alluded to. We can only believe that this is due to our masters themselves being unaware of the disastrous effects on the public health of national teeth neglect. With the hint conveyed in this paragraph we trust they will not fail on suitable occasions to point the moral which this report endeavors to teach.

These and other recommendations made by the Royal Commission clearly indicate the determination of the authorities to carry the benefits of dental treatment to all the citizens of the Motherland, and thus to overcome in a large measure the ravages of dental disease. Government assistance to dental colleges, an increased number of graduates, the teaching of Oral Hygiene, and a State dental service, will bring untold blessing to the general public, especially to those of school age, and will place dentistry on a higher plane by increasing its service-rendering power.

The Oral Hygiene Movement in the United States was launched in 1891, when Dr. G. L. McClune, of Ovid, read a paper before the Seventh District Dental Society of the State of New York. After hearing this paper, in which the writer set forth the urgent need of dental treatment, a committee was appointed to see if it would be possible to establish a dental dispensary for the indigent of the city of Rochester. As a result, in 1892 there was opened at the City Hospital, Rochester, what is considered to be the first free dental dispensary in the United States. This work was abandoned, after a trial of two years, but was taken up twenty years later by younger members of the Rochester Dental Society, who persisted in their aim until a dispensary committee was formed. In 1904 Capt. Henry Lomb contributed money to start the work, and other funds were raised by popular subscription. This second dispensary was established in 1905, and in less than two years two other dispensaries were started in public schools. About this time the Rochester Dental Society opened a mouth hygiene campaign in the public and parochial schools of the city. This campaign, which was conducted by Dr. John Corley, of Greensboro, Alabama, lasted two weeks, and marked the first time that all the schools in any given city had been reached. Commencing with a voluntary corps of dentists, the work of the Rochester dental dispensaries, under the supervision of the Rochester Dental Society, expanded until there were employed three dentists and two lady assistants. In 1917 the work was taken up by the newly organized Rochester Dental Dispensary, housed in a building with equipment valued at nearly a half million. For the first five years the City of Rochester pays $20,000 per year to take care of the prophylactic work in the schools, and the directors each contribute $1,000 per annum. Mr. Eastman has since endowed the institution with a fund of one million dollars.

In 1911 there were only twenty-five cities in Canada and the United States in which instruction was given concerning the teeth and surrounding tissues, thirteen where the children's teeth were examined by a dentist, and twenty-three where there was a free dental clinic in operation. The majority of these clinics were connected with dental colleges. To-day, in almost every city of any size on this continent, a more or less efficient system of dental inspection and treatment has been established. These dental services are operated in different ways; many are under the control of Boards of Education, and the clinics are in the schools; others are a part of the work carried on by the Boards of Health; while still others are financed by private donations and endowments. Prominent among these latter institutions is the Forsyth Free Dental Infirmary, of Boston. The building and site of this infirmary cost half a million dollars, and is endowed with a million dollars for its maintenance. It is furnished with the latest and best dental equipment, including a lecture hall for the teaching of Oral Hygiene to the public.

The State of New York was the first to establish and give efficient recognition to Oral Hygiene in connection with the State Department of Health. This department was inaugurated February, 1913. Cities and towns are visited by official lecturers, who are furnished with the most efficient charts and lantern slides.

Dr. A. C. Fones, of Bridgeport, Conn., is credited with initiating a forward movement when in 1914 thirty-two Dental Hygienists graduated from his school. These young women had taken a course of instruction in mouth hygiene and prophylaxis, and were qualified to be responsible for the oral cleanliness of the school children.

CANADA.

The pioneer in the work of Oral Hygiene, school dentistry and dental hospital work in Canada was Dr. J. G. Adams. While engaged as a farmer, near the town of Elora, he became convinced that he had been divinely called to do missionary work. He left his farm and walked to Toronto, a distance of over one hundred miles, feeling that the nature of his missionary work would be revealed to him when he reached that city. Some time after his arrival he secured a position in a dental office, and there received the education and training which was to qualify him for his life work. Having a heart full of sympathy for the poor, he was quick to realize the vast amount of pain and sickness caused by defective teeth, and determined to use his every power to provide for their regular inspection and dental treatment. With this object in view, he opened in Toronto, in June, 1872, what was, as far as we are able to learn, the first dental hospital. This institution antedated the hospital started at Rochester by thirteen years. In order to give the reader an accurate conception of the great work carried on by Dr. Adams, I will quote from his book published in 1896:

For the past twenty-four years, in addition to caring for the teeth of the children in my regular practice, I have, with the aid of assistants, carried on dental hospital work among the children of the poor of Toronto, filling the teeth *free* for as many such children as I could gather in. Besides this, I have examined the teeth of large numbers of children in the public schools of the leading cities of Canada, and of some of the American city schools, including the largest German school on the continent. I have furthermore examined the teeth of the Indian tribes on the Georgian Bay, and of hundreds of children just out from England, besides a number from Syria, Russia and Japan. The examination of so many thousands of children, comprising those of different nationalities, has given me an *exceptional opportunity* of noting the *condition* and the *change* that is taking place in their teeth. I shall not here touch upon the cause, but shall confine myself to the condition, as I find it, and to the only present practical remedy.

I find that children's teeth decay at a much earlier period than they did formerly, and that the quality of the teeth is so much inferior that, unless they are filled as soon as they begin to decay and while the cavities are small, they are soon past all hope of being saved. I am speaking of the permanent teeth; not only of the sixth-year molars, but also of the twelfth-year molars, bicuspids and superior incisors which now very frequently begin to decay within a year or two after being erupted. I have examined the teeth of a large number of adults from fifty to seventy years of age, who, like myself, have first-class sets of teeth, far better now than *ninety-five per cent* of the children of to-day. In every city I visited I found the teeth of the children in the same neglected condition. Though almost every child had teeth requiring to be filled, there were not *five* per cent who had any filling done. I found only one child whose teeth had been filled at the right time; the rest had been neglected until they were very far gone and were hardly worth being filled, showing that their parents were not systematic in attending to them, but only did so when the children had suffered very much. I did not find, in the schools, *three per cent* of the children with as good teeth as I have at fifty-seven years of age.

In every kindergarten school I examined I found many of the children with from two to four of their permanent teeth decayed, while mine, that I got at their age, are perfectly sound. I cannot, by words, picture the exceedingly unhealthy condition of the teeth and mouths of a large percentage of the children in the various schools I examined. About from *one to five* per cent of the children had sound sets of teeth; *fifteen* per cent had teeth fairly good, but some of them requiring to be filled; about *fifty* per cent had many teeth decayed, some of which were so very badly decayed as to make it difficult to save them, as they would require to be treated for days or weeks, and that heathenish operation performed—*the destroying of the nerve pulp*, an operation that should never be performed on a child; and yet, what can the dentist do when the parents bring their children in such a neglected condition? He has either to destroy the nerve or extract the permanent tooth, which operation is a still more cruel and barbarous thing to do. About *thirty* per cent of the children I found in a still more neglected condition; the teeth and mouths of many of them were so disgusting that no dentist would think of working for them until their mouths had been disinfected. Many of the children under twelve years of age had from eight to twenty permanent teeth in various stages of decay; large numbers of them were dead teeth, mere shells, filled with decomposing food; other teeth were abscessed and the gums covered with vile disgusting pus, which in many cases was very copious.

As is the case in nearly all useful reform, Dr. Adams experienced great difficulty in getting public support in connection with this work. Time and again he appeared before the Board of Education and other public bodies, requesting them to assist in establishing a permanent system of dental inspection and treatment, and while he received considerable support, no direct action was taken.

Some few years ago the Canadian Dental Association appointed an Educational Committee, which has done valuable work by providing moving picture films, lantern slides, and lectures to all dentists and dental organizations desirous of undertaking the work of assisting to educate the public in regard to the ravages of dental decay and the need for treatment. This committee has taken a special interest in school dentistry and the Oral Hygiene movement, and has offered assistance to those engaged in such work. At the last meeting of the Canadian Dental Association, a body known as the Dental Research Committee was formed. This committee will within a short time appeal to all the dentists of the Dominion to subscribe liberally to a fund to be known as the Dominion Research Endowment Fund, and it is hoped that a sufficient amount will be realized to permit the committee to carry on permanent research work in all the dental colleges of Canada, as well as to give financial assistance to individuals who are conducting investigations in connection with important dental problems.

The Ontario Government, after repeated requests made by the Ontario Dental Society, decided to appoint a provincial dental Officer. His duties consist in carrying on an educational campaign for the purpose of persuading School Boards and Municipal Councils to establish permanent systems of dental inspection. The provincial dental officer has received the loyal support of the dental profession in Ontario, more than three hundred having volunteered to give gratuitously sufficient time to conduct a dental survey of all the school children of the province. The objects of this survey were threefold:

(1) To impress upon the children and their parents the benefits to be derived from oral cleanliness.

(2) To emphasize the absolute need of regular inspection and treatment during the early stages of defects .

(3) To gather local statistics to be laid before the municipal authorities in an effort to persuade them to establish permanent systems of dental inspection and treatment.

In some school inspectorates the work has been completed, and shows that ninety-five per cent of the children are suffering from dental defects, and that the mouths of some of the children are in a most deplorable condition.

The educational authorities realize that such a condition is detrimental to the physical, mental and moral health of the pupils, and are giving their whole-hearted support to the campaign for the establishment of a system of dental inspection in each municipality. Already a number of municipalities have made the necessary provision, and in many others the matter is receiving the earnest and serious consideration of the authorities concerned.

The first municipal dental work in Canada to be undertaken at public expense was started in Toronto when the late Dr. W. H. Doherty was appointed to take charge of a dental department under the school medical inspection system. This work was begun under the control of the Board of Education, and provided for a survey of all school children, with notification of parents and free treatment for those who could not afford to have the work done in a regular dental office.

Similar work is now being carried on at Hamilton, London, Ottawa, Brantford, Windsor, Fort William, and other points in the Dominion, and it is hoped that in the near future each of the provinces will have an efficient dental service, not only for the urban but also for the rural districts. The State cannot afford to allow the health of the workers of the nation to be continuously undermined by dental neglect. Steps should be taken without delay to recognize preventive dentistry as the chief means of preventing ill-health, and every possible means should be employed for enlightening the public in regard to the ravages of dental disease. Treatment should be rendered available for all needing it, and especially for our school children. The one asset of the people is health, and without it we are indeed handicapped, poor and miserable. An efficient school dental service means a healthy mouth, and a healthy mouth means greater freedom from disease. The authorities owe this protection to every child. Start a campaign in your locality for dental inspection and treatment. "The next step in preventive dentistry must be made by the dentist." Will you measure up?

Enlisted Men at R.C.D.S.

THERE are 475 enlisted men in attendance at the Royal College of Dental Surgeons, over half of this number being veterans registered in the Freshman Class. There are about 75 registered in each of the other three classes.

Dental Supplies; Past and Present

BY H. P. TEMPLE, TORONTO.

[*The Dental Profession does not accord to the dental manufacturers and dealers, the measure of credit which is due them in connection with the advancement of dentistry during the past fifty years. It is only necessary to compare the progressive attitude of the dental manufacturer with that of the manufacturer of surgical supplies, to appreciate the active co-operation of the former, in rendering every possible assistance to the dentist, by supplying efficient dental materials and instruments. We venture to say that the average dentist does not commence to realize the large sums of money spent annually by the larger dental manufacturers in experimentation and research, with a view to the further improvement and perfecting of their products. No matter how skilful the work of the dental surgeon, the good results of his work are intimately associated with the instruments and supplies of various kinds which he may use, and it is only just that a service well rendered should be acknowledged and appreciated.*

The present issue of ORAL HEALTH, *the beginning of the Tenth Volume, being more or less retrospective, we asked Mr. Temple to outline some of the advances that have occurred during the past ten years in dental supply merchandising, and we feel sure that the manuscript will prove of interest to the Profession.*—EDITOR.]

DURING the past few years many changes have taken place in the distribution of dental supplies in the Dominion of Canada. Those who were in practice a few years ago will well remember the name of The C. H. Hubbard Company, The S. B. Chandler Company, The New Davis Dental Mnfg. Co., The Canadian Dental Supply Company, The National Refining Company, The S. S. White Dental Mnfg. Co., and The Temple-Pattison Company—all of the above being located in the city of Toronto. In Montreal the two old-established houses were The Dominion Dental Mnfg. Co. (under the management of Dr. Lovejoy) and Paterson & Paterson,—both of which firms are still in existence and giving splendid service to the dentists in the Province of Quebec.

The Maritime Provinces were ably looked after by Messrs. Brown & Webb, with a depot at Halifax, and the company is now known as The Maritime Dental Supply Co., with head office at Halifax, N.S., and a branch located at St. John, N.B.

The other depots in Canada consisted of The London Dental Depot at London, Ont., owned by Dr. Henry Rea; The Dominion

Dental Mnfg. Co., of Montreal, who maintained branches at Winnipeg, Man., and Vancouver, B.C.

In 1906 The Temple-Pattison Company opened their first Western Branch in the city of Winnipeg, with Mr. Philip Jamieson as Manager.

As we said in our opening paragraph, many changes have taken place throughout the Dominion. The Canadian Dental Supply Company were absorbed by Messrs. Claudius Ash, Sons & Co., and this depot has since been operated as a branch of that well-known English house, with Mr. Walter Brent (so favorably known to the dental profession of Canada) as Manager. During the year 1905 The S. B. Chandler Co. and The New Davis Dental Mnfg. Co. amalgamated under the name of "The International Dental Co.," with Dr. Geo. Martin as Manager. The following year The Temple-Pattison Co., Limited, purchased the business of The International Dental Co., and at the same time Dr. Henry Rea of London sold the London Dental Depot to The Temple-Pattison Co., Limited, and it has since been operated as a Branch of this firm.

In February, 1909, The Temple-Pattison Co. opened a Branch in Calgary under the management of Mr. A. E. Sinclair, and also another in Vancouver, B.C., under the management of Mr. J. W. Henderson.

In 1912 The National Refining Co. (which a few years before that date had purchased the stock and assets of The C. H. Hubbard Company) sold their retail business to The Temple-Pattison Co., Limited, and their manager, Mr. W. McTavish, became a director of The Temple-Pattison Co. Two years later Mr. McTavish resigned his position to become the Managing Director of the S. S. White Company of Canada, who act as the wholesale agents for the S. S. White Dental Mnfg. Co., of Philadelphia, Pa., following the disposal of their retail depot to the Dental Company of Canada, which has since been operated with Mr. Henry Thompson as Manager.

In 1912 The Temple-Pattison Co., Limited, also opened a branch in Edmonton, with Mr. Earl Pinch as Manager, and in 1916 another branch was opened up in Regina, with Mr. E. E. Rogers in charge.

To-day the dentists practising in Manitoba, Saskatchewan, Alberta and British Columbia are within a few hours' of a dental depot, while some short years ago it was necessary for dentists to send their mail orders from as far West as Victoria, B.C., and as far East as Port Arthur to the City of Winnipeg.

Some years ago the Dominion Dental Mnfg. Company closed their branch in Vancouver and a new depot was opened up under the name of The British Columbia Dental Supply Company—which is still operating under the management of Mr. Wolfe. The Dominion Dental Mnfg. Co. also closed their branch in Winnipeg, and about 1914 a new depot was opened up in Winnipeg by Mr. Chas. Sheriff, well known to the dentists in that district, having operated a large mechanical laboratory in Winnipeg for some years. Just recently Mr. Sheriff sold his depot to Messrs. Claudius Ash, Sons & Co., who continue to operate this depot as a branch, retaining him as Winnipeg Manager.

About the year 1913 the Goldsmith Smelting and Refining Co., of Chicago, opened a branch in Toronto, with Mr. H. L. Nussbaum as manager. Three or four years later another branch was opened in Montreal, with Mr. Ralph Cherry as manager.

Perhaps of greater interest to the dentist would be a summary of the enormous strides which have been made in the manufacturing of Dental Supply Goods. The last decade has seen more improvements in the matter of new, efficient materials and equipment than any period in the history of Dentistry. Their name is legion; among the every-day, small articles which, singly, seem insignificant, but when taken collectively, mean to the dentist a saving of time, security in operations, and greater efficiency. The present tendencies point directly towards "specialization," and this is particularly true of the dental manufacturing business. Dental supplies cover a vast field, and as a result, more manufacturers are taking up *one line of goods* exclusively and making it the very best that science, skill and money can produce,—the result being Better Dental Goods!! During this period, perhaps, the two articles that have been most revolutionary have been the introduction of a thoroughly practical silicate porcelain, and the improvement of tooth forms and the blending of their shades. It is now possible to secure Facings, Crowns and Vulcanite Teeth identical in form and shade, permitting a most aesthetic result, which was not feasible a few years ago.

Materials, medicines, and instruments for the advanced science of root canal and Pyorrhea technique are now obtainable which, ten years ago, were only in the theoretical stage.

The whole system of operating instruments has undergone a complete change of design, now featuring the new short shank handle, which brings the handle of the instrument much nearer the cutting edge and affords a firmer finger grasp, with increased leverage control. The diameter of the handle varies, being carefully adjusted to balance the width of the cutting edge.

Forceps have also received most careful attention, being made in rounded forms, bevelled joints and smooth beaks, and are a vast improvement over the designs formerly supplied the profession.

The dentist, to-day, has also complete sets of instruments for such operations as root amputation and bone curetting which, up to a short time ago, were very crude, indeed. The new technique worked out for infilteration and nerve blocking with Anocain, Novocain and Procaine, has permitted the manufacturers to place at the disposal of the profession improved aseptic syringes and their accessories which cover any given method of technique.

To go into a modern dental office and single out new goods which have proved efficient and practical during the past few years would make an interesting story, but would necessarily be voluminous! Suffice it to say that with the co-operation of the profession the dental manufacturers are ever striving to improve their instruments and materials, and it is indeed doubtful if, under these abnormal times, any other line has made the progress that has been shown by the manufacturers of dental supplies.

The modern dental office, it might be said, has been conceived during the past ten or twelve years. There was a time when all offices were more or less stereotyped,—lacking all individuality,—but a new era has dawned and results, undreamed of years ago, are daily achieved by working into dental offices the same good taste and personality displayed in selecting furnishings for our own homes.

Formerly the profession had only *one finish* from which to choose when selecting equipment, besides the styles, etc., of such articles as cuspidors, engines, brackets, tables, cabinets, and so on, were very limited. To-day the equipping of an up-to-date dental office is one of great interest to both the dentist and the dealer. Finishes can be secured in such colors as Black, Grey, Mahogany, Circassian Walnut, and—even Blue!! This permits the possibility of working out a harmonious color scheme suited to the various conditions with which we have to contend.

The most essential part of all equipment in a dental office is the chair, which can now be lowered to sixteen inches from the floor; the adjustment is practically automatic; the upholstering is sanitary leather, instead of the old dust-collecting plush. Improved adjustments make it possible for the operator to get the position out of the chair instead of out of his own back! The chair used to-day is a decided contrast to the old three-legged affair, which necessitated a hole being cut in the floor to enable the operator to work upon his patients.

Cuspidors are now being made in many attractive designs. The new pedestal which eliminates the rubber tubing is the most popular where plumbing connections are practicable. To a large extent the parts exposed to water are finished in opal glass, doing away with the nickel and brass formerly used. Again, the whole construction of the modern cuspidor is in brass, which was previously cast iron, which had a tendency to rust and cause trouble.

The electric engines are practically all the bracket type, which permits a very much greater scope in installation and banishes all the former trouble with electric cords breaking, as was the case with the old style engine. The electric engines also develop greater power, breaking away from the machinery appearance—which is much to be desired.

Cabinets have been greatly reduced in size, both length and depth, which acts as a check on the human trait to store materials which have no place in a dental cabinet. They are very attractive, plain almost to severity, with a convenient medicine cabinet or holder, opal glass working surface and marble base,—altogether different from the "dining-room buffet" style of not so long ago.

Bracket tables are no longer sold to any extent with the old dust-trap drawers and green baize tops, but are supplied with one piece of smooth opal glass, permitting the operator to have a duplicate for each patient. The brackets are finished to harmonize with the other equipment.

The disposal of waste has always been a problem to the dentist. The new pedestal receptacles (furnished in all the different finishes) contain paper bags, which facilitates the disposal of the waste in a sanitary manner.

Apart from the vast improvement in the standard equipment, the manufacturers have worked out many ingenious unit appliances—commonly termed a "*unit*," which comprises the cuspidor, engine, bracket and table, switchboard instruments, ionization equipment, hot air syringe, spray bottle and gas for Bunsen and bracket table. These are made in a great number of combinations to suit the varying conditions and individual needs, and are particularly desirable in operating rooms where space is somewhat at a premium.

The advanced technique of dental electric therapeutics has been kept pace with by the manufacturers in delivering a practical switchboard cabinet, which controls both high and low voltage currents; these types are portable permitting its most convenient location. The instruments are automatic, that is to say, when an instrument is replaced in the cabinet, the current is automatically cut off.

The most outstanding feature in dental equipment is, perhaps, the new X-Ray machines. To-day the profession are purchasing their X-Ray outfits to suit their particular requirements. This question has been reduced to a great degree of simplicity by means of a self-rectifying tube known as the "Coolidge" tube, which has removed all the mystery at one time attached to Intra Oral Radiography. The X-Ray equipment of the heavier type has also been greatly simplified by the perfection of the Interrupterless Transformer and Automatic Transformer Control, which permits the independent control of the milliamperage and penetration, or "back-up spark."

In an article covering the advances made by the dental manufacturers it would perhaps not be amiss to say a few words as to the progress made by the dental supply dealers. To-day there are twenty-one dental depots in the Dominion of Canada. It is doubtful if the average dentist realizes that a dental depot operating in the city of New York or Chicago has more dentists within a radius of fifty miles than there are in the entire Dominion from coast to coast. In addition, the Canadian depots maintain a staff of thoroughly efficient salesmen on the road, who are constantly keeping in touch with the latest improvements; not so long ago you will remember when the dental salesman carried with him several capacious trunks and as far as possible delivered goods to you direct! To-day the modern dental salesman goes out to sell goods and at the same time endeavors to help the profession by having a thorough knowledge of the business.

It has been brought to our notice that from time to time the Canadian dentist seeks information from the larger centres in the United States. The Canadian dealers are in a position to supply information pertaining to the equipping and furnishing of a dental office and are only too pleased to furnish the profession with:

(1) Architect's blue prints, showing the most advantageous method of laying out a given space, including the positioning of all the plumbing, electrical outlets; in fact, every part of equipment essential to a dental office.

(2) Assistance in working out harmonious color schemes, which include the treatment of walls, floors and windows, as well as the matter of stationery, including letter-heads, appointment cards, statements, announcements, etc.

(3) The installing of a thoroughly efficient book-keeping system, such as are being used by commercial houses. Dentists are rapidly realizing the necessity of installing up-to-date book-keeping systems, which matter a few years ago practically received no attention.

Of the future it is hard to prophesy, but the close harmony between the profession in their researches and the manufacturers striving to improve their goods and materials is bound to develop many great achievements.

Dr. Frank Woodbury Honored

DALHOUSIE UNIVERSITY has honored Dr. Frank Woodbury, Dean of the Faculty of Dentistry, in conferring upon him, at a recent Convocation, the honorary degree of LL.D.

Dr. Woodbury has rendered exceptional service to the dental profession in the Maritime Provinces, being virtually the founder of the Maritime College of Dental Surgery, and has remained from those early times as the guiding force in dental education in the Maritime Provinces. Congratulations, Doctor Woodbury!

Extracts From the First Volume of Oral Health, Year Nineteen-Eleven

[*This being the first number of the Tenth Volume, the writer, in reminiscent mood, turned back over the pages of some of the earlier issues of* ORAL HEALTH. *It seemed as though we were re-visiting a boyhood spot long since forgotten,—enjoying once more the old scenes and rejoicing again in the happy friendships of the years that were gone.*

Among the most sacred of these memories were those associated with W. H. Doherty, who previous to his passing over was Associate Editor of this Journal. "Bill" Doherty was truly one of "God's Noblemen," and his memory will ever remain as a benediction and inspiration to all who were privileged to know him.

We publish herewith a few extracts from the First Volume of ORAL HEALTH, *as possibly being of interest to our present readers.*—EDITOR.]

Extracts

ORAL HYGIENE.

IN choosing this phase of the Health Problem as our special concern we have chosen a sphere of action where the laborers are comparatively few. The seed already sown has grown until today there stands a veritable harvest. In addition to the large field of labor embracing restoration to normal conditions of the teeth themselves, there is a great awakening to the possibilities of Preventive Dentistry, not in the profession alone but in the public mind. We believe such a magazine as this can be of inestimable service.

The problem of oral hygiene can best be handled by the dental and medical practitioners working in harmony, each recognizing his part in this great field of service. The attitude of both professions in regard to mouth health will be materially changed during the next few years and a clearer perception held of the part practitioners have to play in bringing about a more hygienic condition in the mouths of their patients and the part each profession will play in making possible the same results to the average Canadian citizen.

Undoubtedly the greater burden rests upon the dental profession, and the hope of the situation is in the fact that the average dentist is recognizing his obligation, and the dental profession its part, in the great campaign of dental education.

THE DENTAL PROFESSION.

This magazine has sprung into being because of the great need of dental education and in the hope that its pages will be used by the profession in making suggestions that may prove an inspiraton to others. Presenting reports of what is being accomplished "at home and abroad" will prove helpful and be an inspiration to those with willing heart and ready hand. As a profession we have long known that a good masticatory mechanism is an essential to good health, and that much of the sickness and disease in the community were the direct result of the faulty mastication of food. We have long known that thousands upon thousands of these precious organs are annually lost because of neglect. We fully realize that many of these teeth—could be saved with intelligent care by the patient—yet we have hesitated to take up educational work. We were too busy, or possibly we feared the wink and nod of the excessively wise one, who thought he could see through the plan a colossal scheme of the dentist to increase his practice. Of course, it "hurts" to give time and labor to such work and then have one's motives questioned, but injured feelings must not stand in the path of progress. As a profession we must go forward to the task of public enlightenment on dental matters, fearlessly, energetically and persistently, that we may emblazon in the public mind the thought that the modern dentist is not merely a dental surgeon, but also a dental physician. Let every dentist also keep that ideal in mind. A dental physician who practises preventive dentistry.

May the public soon realize that a periodical visitation to a dental office is not sufficient, but that the daily care of the mouth and a persistent maintenance of a hygienic oral condition is the great essential in this fight for better health.

PREVENTION THE KEYNOTE.

In each locality the problem of public dental education will have to be worked out to suit local conditions. No matter what the local details, the golden thread running through it all should be *prevention.* Talk and urge the gospel of prevention to grown-ups as well as to children. The greater hope for the future lies with the child of to-day. Therefore, endeavor to reach the children. If it be impossible to arrange with the local school board for an instruction period during school hours, then arrange for one immediately at the close of school.

The larger centres of population have, in accentuated form, the additional problem of caring for the dental needs of the poor. Every large city has its very rich as well as its very poor citizens, and these latter must be cared for through organized charities and by municipal grant. But even in the large cities the propaganda of prevention ought to proceed quite independent of provision for the poor through public dental hospitals. These will come, but in the meantime, let the gospel of prevention be spread.

Regular periodical examination of school children's teeth is of value only as an examination to test progress, just as is any other examination But what progress is there to test when little or no instruction is given? The first step is instruction in prevention. The great need of the hour is dental instructors, and following that, but incidental to it, the periodical examination of the teeth as a test of the pupil's progress in oral hygiene.

Examinations of school children's teeth have been held a score of times in different parts of Canada and the United States, and have been invaluable in showing the deplorable oral conditions. These examinations have all shown practically the same condition, viz., only 10 per cent or less of the children with sound teeth and healthy mouths. These figures have been substantiated so often that they are absolutely beyond question. They are true of every locality.

Children ought to be trained to feel that in the vast majority of cases the decay of their teeth could have been prevented by a proper mastication of their food and a maintenance of proper oral conditions of cleanliness.

In cities the school authorities might appoint a dental instructor.

In other districts the Provincial Government might appoint instructors to go from section to section.

In the meantime the local dentists might, in so far as possible, give this much needed instruction to the school children in their respective localities. Start the ball rolling.

The Unemployed.

One of the most difficult questions with which the sociologist has to deal is the problem of the unemployed. The greatest anxiety is not felt concerning the unfit and decrepit. All such who are in need have a valid claim upon the state. Nor is great anxiety exercised in contemplation of the able-bodied but lazy citizen whose flesh indeed is willing, but whose spirit is weak. The real problem of the social reformer is to so plan that work will be provided for those who are willing and able, but who, under present conditions, cannot find work to do.

The dental profession also has its own great problem of the unemployed to solve. The problem of the vast army of good, sound, healthy but unemployed teeth. Teeth that are able and willing, but are given insufficient work to do. If properly employed they would be cleaner, stronger and healthier and have years of useful service added to otherwise short, painful and unhappy lives.

The most concern is not felt for the unfit and decrepit teeth. These have a valid claim upon their owners (or perchance the state) to procure for them proper attention. The greatest anxiety is exercised over the good sound teeth that are able for work, would be better with it, and yet are denied their legitimate needs.

Not that there is lack of work for such teeth to do. The problem is not one of *more food*, but of *food better masticated.* The question is a present-day problem because the owners of these unemployed teeth choose the easier way—too busy or thoughtless or negligent to give their teeth proper health-giving exercise.

This is the great *problem of the unemployed* that the dental profession is endeavoring to solve.

Its solution is part of the propaganda which has become popularly known as "dental education."

Is your shoulder to the wheel?

RAISING THE STATUS OF DENTISTRY.

It is surprising how many intelligent people still have the notion that cavities of decay and lost teeth bring joy to the dentist's heart. Public dental education has not only given much-needed instruction to the public in the prevention of decay, but has also clearly shown that dentistry delights in a healthy hygienic mouth, rather than in decayed and lost teeth. As the public come to realize that the dental profession stands for *health* rather than *disease* and for *prevention* rather than *cure*, dentistry will be more generously accorded the high place it rightly deserves among the scientific professions.

Thus public dental education has done much during the past few years to raise the status of dentistry and will, no doubt, continue to be a large factor in raising the public's estimation of the dental profession.

Military Dental Association—M.D. No. 2

ON Wednesday evening, December 10th, a meeting was held in the Assembly Room of the Royal College of Dental Surgeons, Toronto. A large and enthusiastic gathering of members and ex-members of the Canadian Army Dental Corps, C.E.F., together with dental students, dental mechanics, and those taking vocational dental training, who had served in other units, voted unanimously to form an association for fraternal, professional benefit and patriotic aim. The following officers and executive committee were elected to carry on the work of the association until the next general meeting in the spring of 1920:

President—Dr. G. Hume.
First Vice-President—Dr. W. E. Cumner.
Second Vice-President—Dr. E. Grant.
Secretary—Dr. H. Reid.
Treasurer—Dr. W. Wilmott.

Messrs. W. V. Byrne, L. M. Martin, F. M. Lott, K. Hall, and K. E. Harris.

Amalgam the Un-Aristocratic*

BY C. W. MEGUIAR, D.D.S., FRANKLIN, KENTUCKY.

WITH other members of this society I have been drafted on this occasion to present to you, briefly, the merits of a tooth-repairing material which had a rough voyage in its early career.

In the outset, I desire to declare my loyalty to the subject and obey the orders received, but don't understand me to advocate the employment of this material in any case where its defense is not established, or cannot be established, because at this day and time, that will invite attention toward me, rather than toward the subject.

The ups and downs of Royal Mineral Succidendum, now designated amalgam, remind me of my experience in a fast express train recently. The going was good, then, suddenly, it was rough, spiraling and loopety loopy, with sure destruction looming vividly in the terrific crash that followed. I still wonder at my deliverance. However, I am here, in new apparel, practically unscathed and on my way.

Amalgam has had a tortuous and corkscrew trip, but is here in new apparel and on its way—quite a way. Sledge hammer blows have been dealt it by iron-jawed, courageous men in efforts to send it to the junk heap. Influential men, leaders in our art, have scoffed and jeered at it, condemned it and denied it a place, or even recognition. Men who employed it were counted beneath the notice of certain eminent practitioners.

For a period its only noisy friend was the quack, who embraced it as a sheet anchor. He baptized and rechristened it "Silver," proclaiming it his own, and, in this, he found much profit and increasing notoriety.

Many conscientious workers noted its performance, made its intimate acquaintance and became adepts in its manipulation, and, at prices from one-half to one-fifth those of their scornful gold-worshipping competitors, actually saved teeth and had satisfied come-backs. While the one class decried, condemned and threw stones, the other kept the faith, got results and patiently labored on.

Popular demand, a great influence and persuader, intruded and tarried awhile. New alloys appeared from time to time, but slight gain was made toward improvement in quality. Then, according to the well ordered program of Destiny, the eternal cycle mill ground, and Black, the student, investigator and scientist, the man for the work, appeared.

How impressive becomes the thought when we reflect upon the promptness with which such characters always have appeared to meet a pressing demand of the hour! Think of the demands that summoned Fulton, Lincoln, Edison, Bell, Marconi, Wright, Maxim, Gorgas, Geothals and Foch to their work.

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*Read before the Kentucky State Dental Association, 1919.

Upon the completion of Black's research and careful work Amalgam modestly got up and went over the top into the thick of the fight; and it has steadily pushed forward until the gap is closed and its salient rests firmly against that of Gold, its principal ally in the struggle for permanent restoration.

In its cloudy days the quack found in it a friend and renamed it "silver," because he wanted to claim it. In its refinement and palmy days we have found in it a friend and, though we do not want to commercialize the name of its gifted refiner, I sometimes think we would honor and perpetuate his memory to simply call it Amalblack or Amalgablack, with a capital A.

Authorities state that seventy-five per cent of all the fillings made in teeth are of this material; therefore, to banish it now from the average dental practice is equivalent to taking an indefinite vacation.

The one great objection, its color, is also the chief objection to gold, its aristocratic ally. Were it composed of noble metals as rare as gold, its color would not offend; and it would obviously become the popular favorite. But, gold and yellow are as intimately associated as are gold and great value; hence, people of esthetic inclinations have little difficulty in compromising with the flashy color of this royal metal. Platinum and its metallic gray are associated just as closely and, no doubt, the same people would readily accept it as to color, being soothed and flattered by its distinguishing hue and knowledge of its great value. A well-made and well-kept amalgam filling is equally as sightly and far superior to one of platinum; and is equally as serviceable as one of gold. Thus, it appears that were amalgam as rare or as dear as either gold or platinum, it could occupy even the anterior teeth without prejudice.

You may think that a bold statement. Surely it is. My mission on this occasion is to laud the virtues and proclaim the possibilities of amalgam, proven by its record as a tooth saver. If you don't accept the statement, gentlemen, get up and unswallow your tongues and attack my position. I am representing the client and propose to claim all I believe to be true and reasonable. Unreservedly, I claim that if the intrinsic value of these two materials, gold and amalgam, were proportionately reversed, a decade would find gold as a tooth filler yielding steadily to amalgam, even in the anterior teeth. If you ridicule this statement I refer you to the sentimental craze for the costly platinum mountings of jewelry. How much better is the color of platinum than a high grade, polished amalgam?

You well know the great value of amalgam as a tooth preserver, but, in order that you may more fully comprehend and appreciate not only its worth, but also its actual advantage in permanency over any other filling material, the following facts should be noted: There is *no cavity or condition* of decay in the exposed surfaces of teeth in which a high-grade amalgam filling will not secure as *permanent* results as gold or other material; there is no cavity or condition of decay in the exposed surfaces of teeth in which a gold or other filling material will exceed high grade amalgam in permanency; there are many cavities and conditions of decay in teeth *in which amalgam will exceed gold and other filling materials in permanency.*

For incisal edge, or angle, restoration only, the gold inlay is here excepted, because when properly made, fitted and anchored it is, in permanence and service, decidedly the peer of all known materials, including porcelain, which may chip and rarely matches the tooth shade very long.

There are members of this society present who recall the first Matrix Gold Inlay clinic of any record whatever, given by the essayist in Louisville in 1901, or 1902. I still have those three clinic gold inlays and prize them very highly, for their progeny is legion. Comes a time when they perhaps will occupy a pedestal midst dental archives and pioneer creations. The gold inlay in skillful hands is dependable, though not ideal for restoration because of its color. The same statement is true for amalgam, with the additional advantage of economy in time and expense.

Recall those badly-neglected cases in which no other material was indicated and you merely patched them up with amalgam until the inevitable day for extraction! Recall that upon return of some of them you took heart and did some real careful work in restoration, using again this once despised material to save a condemned vital organ!

It follows: That if these deductions regarding color tolerance, or color prejudice are true, then, we must give more attention to amalgam restoration and *charge as for gold*, or be content to employ this very valuable material out of sight until metallurgical chemistry evolves means to emancipate it from its unfair color environment.—*The Dental Summary.*

Obituary

ARNOLD REA.

DR. ARNOLD REA, of Calgary, Alberta, was a victim of the dread malady, "sleeping sickness," and passed away 28th November, 1919. Dr. Rea had been associated with Dr. Healy for some months previous to his death. He had resided in Alberta for ten years, and was a graduate of the Royal College of Dental Surgeons of Ontario.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

K.C.N.S.—A FACTOR IN PREVENTIVE DENTISTRY.

ONE of the problems facing the dentist is to decide just to what extent he ought to rely upon medication in his efforts to prevent tooth destruction. Quite often he inclines to the view that he must work more along the line of mechanical prophylaxis rather than resort to medicinal means. Why is this the case? Why do medical practitioners question the wisdom, or, shall we say, lack of wisdom, in having dentists issue prescriptions? It is quite true that such objection is not always made openly, but many times unflattering comments reach us in an indirect way and lessen our enthusiasm for treatments via the prescription route. We feel as though we are encroaching upon ground not properly ours. It is quite conceivable that a patient might be receiving treatments from both dentist and physician, and that some confusion may result therefrom, but if we can satisfy ourselves as to our right to prescribe, or, better still, if we agree to co-operate with the physician, then there is opened up to us the opportunity to do much for the prevention of dental caries by means of medication.

Great advancement has been made in the various methods for the prevention of tooth decay by mechanical means; progress has also been made in the attempts to account for cases of susceptibility and immunity. These questions have been gone into very thoroughly and much valuable scientific data collected. In spite of the differences of opinion regarding the causation of dental caries, progress has been made towards a solution. Is it not possible or even probable that we have placed a very narrow interpretation upon Dr. Miller's theory? Dr. F. J. Rhodes, in a paper recently presented before the Manchester Odontological Society, thinks that we have. He says, "Dr. Miller proved conclusively that the theories holding the field in his day were incorrect ones," and his findings stand true to-day, if not *all* the truth. The sequence, carbohydrate fermentation, lactic acid production, enamel disintegration and dentine liquefaction, etc., are well known to all. But though later men have seemed even to teach as if the whole vicious cycle of dental caries was wrapped up in these words, Dr. Miller did not think so himself. He considered and said that "this alone is not sufficient to produce caries;" also "it is evident that caries of the teeth must be the result of two groups of forces acting upon each other, and that one group is to be sought for in the teeth themselves, and the other in the surroundings of the teeth." This seems to place Dr. Miller's theory in line with those advanced by more recent investigators.

What is the present status of the causation theory? Many will reply that in spite of all the time and effort spent in finding a solution, the ultimate cause of dental caries is still wrapped in obscurity. But we are making headway. Let us review some of the conclusions arrived at by a few of our representative teachers. Dr. Rhodes in his excellent paper, already referred to, states that Dr. Pickerell thinks that there is no special bacterium of decay, whilst Dr. Hopewell-Smith thinks there is, and that nobody has been clever enough to cultivate and isolate it. Again, Dr. Evan Waller thinks that internal secretions are the first links in the chain of dental caries. Dr. Jones, of Cambridge, considers that dental caries arises solely from within the tooth. That it is a necrosis of one or more of the enamel prisms, in the same way that honeycomb teeth caries consists in the perishing of masses of prisms. A putrefactive process in fact. This postulates that the whole tooth is alive from pulp to periphery, and that the enamel has a metabolism, and is in fact alive. This he definitely claims, as also that its covering (Nasmyth's) membrane is vital—a claim conceded by many modern observers. He considers "post-eruptive hardening" of the enamel to be via the pulp, a calcification from the pulp in contra-distinction to the more generally accepted theory that the hardening occurs by dialysis of salivary calcium and magnesium through Nasmyth's membrane.

From the extensive investigations of Dr. Pickerill we learn that the mouth and teeth must not be considered as an entity in themselves, because they are only a part of the great alimentary tract, an interdependent part, subject to the same laws of development, health and disease which govern the remaining parts. Dental surgeons have been prone to look for the cause of every ailment in the teeth themselves, whereas we ought to recognize that the disorganization or loss of function of one or a set of organs will lead to disease in the allied organ as well. "Dr. Pickerill's work proves," says Dr. Rhodes, "that notwithstanding Tomes and Black, enamel is not the same in susceptibilities and immunes. . . . He also shows that the properties of enamel which affect us are physical ones. He finds two kinds of enamel—(1) sclerotic hard, dense and little permeable, its glaze, to use a term of pottery, is very perfect; (2) malocotic enamel, much softer, less dense and much more permeable. This means inferior development of the tooth, probably both intra and extra uterine, and postulates a weaker stock, so that we have to, as some of us have done previously from our own clinical observation, alter our ideas gained from Tomes and Black in this respect and admit that the structure of many teeth is defective, or at least inferior, and that they are less liable to withstand disease, like every other part of the body not properly developed."

If from the foregoing we were to attempt any classification of the modern views regarding the question of the causation of dental caries, we might suggest that there are three schools of thought—(1) those holding to the carbo-hydrate fermentation theory; (2) those holding the view that caries is aided by pathological defects within the tooth substance; and (3) those who believe that both structural defect and lack of proper conditions surrounding the tooth cause its destruction.

Practically all investigators agree that one of the exciting causes of decay is the carbo-hydrate fermentation and its sequelae. But the question arises: Why is the fermentation process harmless in some mouths? Why does it fail to decalcify some enamels? The answer usually given is "immunity." Well, then, can we produce this immunity by artificial means? Some say we can. Let us consider this a little! We often observe cases of immunity in patients who freely confess that they seldom, if ever, brush the teeth. Quite often they relate similar freedom from dental ailments on the part of the parents. This seems to imply that whatever structural defects may have been present in the teeth, the environmental conditions were such as to prevent the vicious attacks of the fermentation products. How was this accomplished? Can we produce immune conditions in mouths naturally susceptible? Dr. Rhodes believes that we can. "It is not possible," he says, "to remove all infection, all evil influences which may be present in the mouth, but they can be reduced and the health and consequently the resistance of the tissues and organs increased and the balance between the strength of the attacking forces and the resistance of the tissues swung towards immunity and away from susceptibility, thus producing a degree of mouth health previously considered impossible. In this desirable result and on these lines K.C.N.S. medication has an important part to play."

Dr. John Porter Michael, one of the earliest students of salivary constitution, found as a result of frequent analyses of saliva, that K.C.N.S. was always associated with immunity from dental caries when present in full quantity, and when it was absent or in lessened proportions, caries was abundant. He learned that salivas grouped themselves into three types—(1) normal; (2) hypo-acid; (3) hyper-acid; the first and last tending towards immunity, whilst the hypo-acid were accompanied by great susceptibility. In addition, he ascertained that variations in the standard of health make corresponding changes in the composition and reaction of saliva, and he lays down as an axiom that "salivary composition is a reflex of the metabolism of the body at any given time." In order to try out his theory he experimented by administering K.C.N.S. internally to cases of intractable caries. Marked improvement in these cases was noted.

Regarding K.C.N.S., Dr. Rhodes says, "It is used in general medicine as an anti-spasmodic and anodyne in phthisical cough, dyspnoea and mania. The dose is 3-4 to 3 grains. Sulpho-cyanic acid is one of the constituents of normal saliva, and in the mouth is found in combination with either sodium, potassium, or ammonium. The NH_3NO_4 is injurious, as it breaks down into nitrous, and further into nitric acid under bacterial action and in prescribing, the K salt only is used. It occurs in the saliva as the result of proteid metabolism in the body. Elaborated by the liver, it passes via the blood stream and lymph channels into the salivary glands, and is excreted as a constituent of healthy saliva in the mouth."

The K.C.N.S. formula has not been generally accepted. However, such men as Low, Muntz, Hecht, Beach, Gregger and Bunting are among its advocates. In America Drs. Waugh and Gies reported unfavorably regarding it. Dr. Gies was perhaps its strongest opponent, but he has modified his earlier judgment by saying that if the administration of the drug did no good it certainly did no harm.

If we wish to have the clinical evidence of a dental surgeon who has used this method of treatment continuously we might refer again to report given us by Dr. Rhodes. The benefits claimed for it are as follows:

(1) It prevents plaque formation.

(2) It will dissolve plaques.

(3) It directly inhibits (in the mouth) the growth and activity of acid-producing bacteria, and those also that peptonize and disintegrate the organic tooth structure after decalification.

(4) It exercises trophic action with all its favorable sequelae of full functioning and reaction to stimuli with prevention of all the evils resulting from a mouth condition approaching stasis.

(5) It considerably delays acid production.

(6) It prevents undue viscosity of the saliva.

Dr. Rhodes is of the opinion that the lessening of the viscosity of saliva is an important factor in the reduction of dental caries. He also finds that the use of K.C.N.S. apparently has a hardening effect on the enamel.

The method of administering the drug is described as follows: "Tablets are prescribed containing each one-half (1-2) grain K.C.N.S. and 1-2 grain hydrastis. The hydrastis is put in because it is a tonic stomachic and alterative. The course of treatment is a six or eight-week one. The tablets are taken alternate weeks. There are, therefore, in a six-weeks' course, three resting weeks in which no K.C.N.S. is taken. The dose for an adult is three tablets a day of half a grain each. Children, twelve to sixteen years, two tablets; children, six to twelve years, one tablet per diem. If desired to still further increase the efficiency of the treatment, K.C.N.S. may be given orally as a constituent of a dentifrice, but it must not be put into any formula that occurs to the individual prescriber, as some constituents, it is conceivable, might break down the sulphocyanide, which is harmless, into the deadly poison K-cyanide. I think little purpose is served by the use of the dentifrice with K.C.N.S. in it when it is being administered internally, but I believe it to be of remarkable utility if used after the internal administration has ceased."

It is claimed that the internal use of K.C.N.S. shows to best advantage in the treatment of intractable caries in children. In cases where it seems almost impossible to keep pace with the inroads of caries, this medication proves of value. Also in cases of pregnancy when the salt disappears from the saliva of women and caries progresses by leaps and bounds, it is of benefit to prescribe this treatment, beginning at the second month, but leave out the hydrastis from the fifth month onwards (uterine contraction). The dose is 2 1-2 gr. tablets daily, bi-weekly. It is advisable, of course, to work in such cases in co-operation with the physician.

A Suggestion for Study Model

DR. B. M. OTT offers a valuable suggestion for the above purpose, and writes as follows:

"We poured a set of individual teeth in Melotte's with a small tack, 1-2 in. long, protruding apically from each; these were then set up in moldine, and a plaster model then built up around the moldine. It is now quite simple to remove any teeth, or place in any desired direction to represent or to describe a case under study.

"There are cases where it is not necessary or convenient to the patient of taking an impression for study; all that is necessary is to have in mind the condition of the teeth, then remove or arrange the teeth on the 'study model.'

"For demonstration or quiz purposes to students, if made in celluloid, etc., teeth may be arranged and appliance advisable asked for."

It would seem that this suggestion carries decided possibilities both in teaching and in dental practice.—W. E. C.

MULTUM IN PARVO

This Department is Edited by

C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

FINISHING UP VULCANITE.—After sandpapering use emery and pumice, mixed half-and-half, followed by pumice alone; finishing with whiting.

REPAIRING PLATINUM NEEDLES.—Repairing conduction 1 5-8 in. platinum needles broken off at shank. Take small round bur, size 1-2, and drill out the broken needle, starting at end of shank next to syringe. Slip the broken needle in far enough so that solder cannot possibly close up hole in end of needle and solder with silver solder. Better still, have your jeweller do this for you.—M. S. Mills.

PLATE POLISHING.—Metal plates will take on a very high lustre when a little aqua ammonia is used in mixing the chalk instead of water. Vulcanite will take on a mirror polish if the finishing is done by the use of tin oxid made into a paste with glycerine. In either case a clean buff should be chosen, and kept exclusively for this purpose.—Dental Record.

FORMULA OF IODINE AND BENZOL.—Take 9 parts tinct. iodine and 1 part benzol. Mix. This gives 90 per cent iodine and 10 per cent benzol. This preparation is fine for sterilizing and anaesthetizing zone of operation. Very penetrating and always stable.—F. J. C.

TO HOLD A FRACTURED JAW FOR IMPRESSION AND ADJUSTMENT.—In all articles on fracture of the jaw, there seems not to have been given the most accurate way of taking a successful impression. Make rather loose fitting bands of regulating strip of about 36 gauge or liberty (nee German) silver 38 to 40 gauge to cover two teeth on each side of the fracture, solder each pair firmly together, and then accurately align the edges of the teeth at the fracture with the bands slipped on; then hold the two sections of bands in line with sticky wax, remove, solder them together, and cement into place for a permanent splint. This will allow you to take an impression or do any other work necessary, without pain to the patient, and with greater assurance of success than by sawing the model and trying to adjust fragments.—(*Dental Cosmos*).

REMOVAL OF RUST FROM STEEL INSTRUMENTS.—To remove rust from steel instruments, Sangu recommends placing them overnight in a saturated solution of zinc chlorid. The rust disappears through reduction. On removing the instruments they are to be rinsed in clear water, placed in hot soda and soap solution, and dried. It is also advantageous to polish with absolute alcohol and chalk.—Pacific Medical Journal.

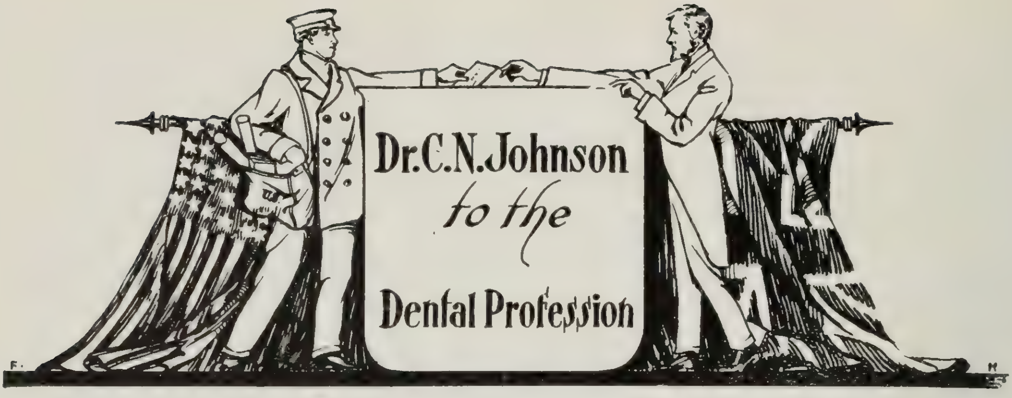
DIAGNOSIS OF NECROSED PULP.—Necrosis of the pulp is frequently met with. A pulp may be dead for months without causing any disturbance; it may be discovered on examining the teeth of a patient without the latter having any knowledge of its existence. The tooth under observation is often more or less discolored, heat or cold produces little or no reaction, and the translucence has usually become dulled. But the safest diagnostic aid is the electric current—a necrotic pulp does not respond to even the full current of the ordinary battery. The pathological types of pulp necrosis, viz., coagulation, colliquation, caseation, and mummification, play no part in the diagnosis proper.—Dental Summary.

CROWNS AS USED BY SPIES.—A daily paper reports a curious incident in connection with the capture and execution of a certain spy. He had been shot and the usual formal post-mortem examination was held. This provided convincing proof of the spy's guilt—if it were needed. The spy had a gold crown upon one of his teeth, and this was found to be hollow, and to contain a micro-photographic code message, which had to be photographed and enlarged before it could be decoded successfully. Banded crowns have been suspected of being the harbingers of many deadly messengers, but we doubt whether such a content as this had ever been thought of before. The possibilities of the removable crown are evidently more dangerous than we had taken to be the case.—Dental Cosmos.

Canadian Dental Association Meeting

THE Nineteen-Twenty Meeting of the Canadian Dental Association will be held at the Chateau Laurier, in the City of Ottawa, on the 23rd, 24th, 25th and 26th of August, 1920.

The committee in charge of this meeting is planning to make it the best in the history of the Association, and it is hoped that every member of the profession in Canada will make a sincere endeavor to be present in Ottawa during these days. It is not too early to look forward to this meeting. Indicate this important engagement in your appointment book *now*, so that no other plans may interfere with your attendance.



Charity

It is true that "charity covereth a multitude of sins." To be charitable is to grow. Charity is the sweet savor which softens life, and lends a perfume to the pathway of our existence. Away back of every generous deed or impulse there lies the mellowing mentor of charity.

We see a man do wrong and we condemn—we are so quick to condemn, we do not stop to trace the mainspring of his motive or sound the limit of his temptation. We merely condemn. For every act there is a reason, and while we may not be able to subscribe to the philosophy of the man who defends himself in wrong-doing, yet we should have a care that we do not too harshly judge till we have known the influence which surrounds the man, and which probably led him to do wrong.

Let us ascend the heights and look broadly over the landscape of human experience. Let us see how men's souls are tried by adversity and by black despair. Let us take note of the warp that is given men's minds by the buffets of fate. We shall then not too freely censure when men misstep—we shall consider and be charitable.

Insomuch as we measure out charity to others may we expect charity ourselves; insomuch as we blame, may we be blamed. To be charitable of others makes us less likely to need charity ourselves, to mete out censure renders us subject to be censured.

Why have not men learned the sublime lesson of charity and generosity? Why have they not soared in the blessed atmosphere of faith and forgiveness? Why have they not made a fact of the brotherhood of man? Only because they have not sufficiently emerged from the influence of the jungle and the cave; only because the law of the club lingers in the recesses of their minds; only because they unwittingly subscribe to the ancient tenet that might makes right.

When spiritual love came into the world it began to drive out the forces of hatred and retaliation, and planted the seeds of charity and kindliness. Charity is the hand-maiden of cheerfulness, the foster-sister of forgiveness. It sweetens life like incense from above, and forces out of the heart the weeds of envy and distrust. Charity warms into a soft glow, but never scorches the soul that envelops it. Charity makes angels of men, and balks the subtlety of sinners. It harbors happiness instead of hate; it fosters light and dispels the dark. Charity is the salvation of the world—the hope of future generations. It is the greatest of the virtues, and the surest sign of civilization. It marks the transition from the savage to the sage, and sends the soul soaring toward the summit. Charity is the one thing needful to make humanity happy and the world a paradise. Let us pray for charity.

C. N. Johnson.

Dentist Wanted in Korea

DR. O. R. AVISON, President of Severance Union Medical College and Severance Hospital, Seoul, Korea, is calling for a dentist, and describes the need as follows:

"Would you kindly try to find for us a missionary dentist who has a general knowledge of dentistry and a special knowledge of mechanical dentistry, including porcelain work?

"The conditions of appointment would be those applicable to a missionary. The qualifications of such a man might be passed upon by one of the mission boards in the usual way. We can guarantee his missionary salary at this end.

"Our present dentist, Dr. Scheifley, will be going on furlough next fall (1920), and it is very important that a man should come as quickly as possible so as to get some of the language and be fitted into the work before Dr. Scheifley leaves."

Particulars regarding qualifications, remuneration, etc., will be furnished to anyone who wishes to consider responding to this call. There is probably no more attractive and no larger field of service in the Orient for the Christian dentist, who wishes to invest his life where it will count for the most, than this position in connection with the large and growing Severance Union Medical College in Seoul. For information communicate with A. E. Armstrong, 439 Confederation Life Building, Toronto.

ORAL HEALTH

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EDITORIAL

The Code of Ethics

QUESTION—Has the time-honored, much discussed, much revised Code of Ethics served its day and generation? Should it be superseded by something more in keeping with professional ideals of the present day? These are years of progress, and particularly so in the professions pertaining to the healing art. The conclusions and ideals of yesterday are on the scrap-heap to-day. We are continually moving forward to better things. Can as much be said in connection with our Code of Ethics? It has undergone little or no change in the last quarter of a century. Why this exception to the great law of progress? Has it within it so much of the angelic and Divine that it is beyond the laws of growth and decay? This is at least a debatable question.

What do we mean by "Professional Ethics"? Simply the principles of morality or ethics lived out in the professional life.

The ordinary Code of Ethics of to-day resembles too much an ordinary set of rules and regulations for the guidance of professional men in the conduct of their practice—"Thou shalt" and "Thou shalt not"!

The truly ethical man is one who is ethical or moral in all his professional relations, because the principles that govern that man's life would not allow him to be otherwise. He will not speak disparagingly of a neigboring practitioner because the code rules it as unethical, but because his whole being abhors such an act.

Professional ethics is, as we have said, great moral principles carried into and demonstrated in professional life..

The old Hippocratic Oath, which had its origin two thousand years before Christ, and which forms the basis of all modern medical Codes of Ethics, is a clear statement of the great principles which should govern members of the healing professions. Its essentials are worth quoting:

> "*I swear by Apollo, the Physician, and by Æsculapius, that I will reckon him who taught me this art equally dear to me as my parents, to share my substance with him and relieve his necessities if required, to look on his offspring on the same footing as my brothers. I will follow the system of regimen which, according to my judgment, I consider for the benefit of patients, and abstain from whatever is deleterious. I will give no deadly medicine to anyone if asked, nor suggest any such counsel. With purity and with holiness I will pass my life and practise my art. Into whatever homes I enter I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption. Whatever in connection with professional practice or not in connection with it, I hear or see in the lives of men which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret.*"

Here we have the principles that should govern the truly ethical practitioner bound up in very concise form. The medical or dental practitioner whose professional life is measured by such a worthy standard is inded the truly professional man. Rules and regulations are necessary and important for the guidance and direction of children, but as professional men of intelligence, living in the new dispensation, should we not be guided by the spirit rather than by the letter of the law?

Therefore, would it not be a decided step in advance to consign our modern Code of Ethics to the waste basket, and take up anew the old and revered Hippocratic Oath as the principles governing all our professional life and activities?

Rea Proctor McGee, M.D., D.D.S.

DR. R. P. McGEE has been appointed Editor of Oral Hygiene, succeeding the late Dr. Wm. W. Belcher. Dr. McGee has been rendering service in the U. S. Army, where he attained the rank of Lieutenant-Colonel, and, though he previously practised dentistry in the City of Denver, he is now taking up practice in Pittsburgh, that he may be in closer touch with magazine work.

Dr. McGee is the author of a series of articles dealing with the teeth, which are to be syndicated by The McClure Newspaper Company. The McClure people plan to arrange for the distribution of these articles through the various local newspapers of the country, and doubtless their wide distribution will have a very marked effect upon the Oral Hygiene movement. Dentists throughout Canada, who feel that a series of well written articles upon different phases of dentistry should appear in the local press, would do well to urge local newspapers to communicate with the McClure Newspaper Syndicate, with a view to securing the rights of publication of this excellent series of articles.

ORAL HEALTH extends to Dr. McGee sincere good wishes upon his taking up editorial work, and hopes that he may meet with unbounded success.

Obituary

WILLIAM W. BELCHER.

DR. WILLIAM W. BELCHER, Rochester, N.Y., was born at New Milford, Pennsylvania, August 27th, 1866, and received his first training in Washington, paying his own way by work in the private laboratories of local practitioners.

Later he entered the Philadelphia Dental College and Garretson Hospital of Oral Surgery, graduating in 1889.

Following one year in Rochester with Dr. J. Edw. Line, he practised for six years in Seneca Falls, N.Y., returning to Rochester to become associated with Dr. Henry S. Miller.

Within a year of this relationship he opened an office of his own, continuing in practice until the beginning of the illness that terminated in his death.

From 1910 to 1913 inclusive he edited The Rochester Dental Dispensary Record, a bi-monthly supported by the Rochester Dental Society, and largely instrumental in interesting the public-spirited citizens of Rochester, and later the municipality itself, in free dental dispensaries for the children of the city's worthy poor. It was the success of this movement and the interest it aroused that resulted in the great institution founded by Mr. George Eastman.

Five years ago he became editor of Oral Hygiene, and through its pages had made the dental dispensary idea common property throughout the English-speaking world. He was a member of the Rochester Dental Society, the Seventh District, the New York State Society and the National Association.

Dr. Belcher passed over on December 4th, at his home in Rochester. Interment made in the family plot in the cemetery at Auburn. A delegation of dentists of Auburn met the remains at the depot, six of them officiating as active pall-bearers.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, FEBRUARY, 1920 No. 2

Johansson Blocks

A Striking Example of Adhesion of Steel Surfaces Accurate to 1/100,000 of an Inch.

MAJOR W. E. CUMMER, C.A.D.C., TORONTO.

INTERCHANGEABLE manufacturing, the results of which the dental profession is familiar with, in interchangeability of parts such as dental engines, hand-pieces, microscopes, and other parts, manufactured at remote points and readily inserted by the dentist, or his assistant, without fitting, to replace worn parts of above apparatus, depends entirely upon a system of gaging or measuring known as the "Limit System." The "Limit System," in turn, in a factory in which these parts are fabricated, in a similar manner to an immense variety of other parts, such as, Cash Registers, Automobiles, Microscopes, Machine tools, and other parts, consists in the use of, by the individual workman, Snap Gages made up of U-shaped parts of steel with two sets of contacts. The first set of contacts, called the "Go-Contact," permits a part, such as a handpiece mandrel which the individual workman is making from bar stock on his machine in large numbers to pass between. The second pair of contacts, placed on the snap gage, just a small distance behind the "Go-Contacts" on the U-shaped ring and also set a very small part of an inch closer together and which are called the "No-go Contacts" do not permit the parts to pass between. Thus, by the original setting of these contacts to almost imperceptible differences of distance, called "Limits," the workman, by constructing each piece to pass between the "Go-Contact" and not to pass between the "No-go Contact" almost unconsciously trains himself to work to extremely close limits.

The 1/10,000 part of an inch is a standard in a large number of manufacturing plants both in Canada and United States. The "Limit System" is also applied in interchangeable manufacturing for the close measurement of holes or recesses into which accurately made parts must fit. For this purpose, the "Snap Gage" is not used, but the reverse of these, called, Plug Gages, are used. These Plug Gages consist of double ended mandrels, one end of which the "No-go end" will not enter the recess made by the workman in the special part on which he is engaged. The other end of the mandrel, the "Go-end" will enter the recess made by the workman. Thus, as above, close limit of recess forming may be secured by the use of "Plug Gages" with minute differences between the diameters of the "Go" and the "No-go end." *Figure* 1 shows the use of the "Snap Gage" in manufacturing of interchangeable parts. *Figures* 1 *and* 2, the use of the Snap Gage.

All gages, "Snap" and otherwise, in a manufacturing plant, must, at short intervals, ordinarily two days, be carefully checked and in

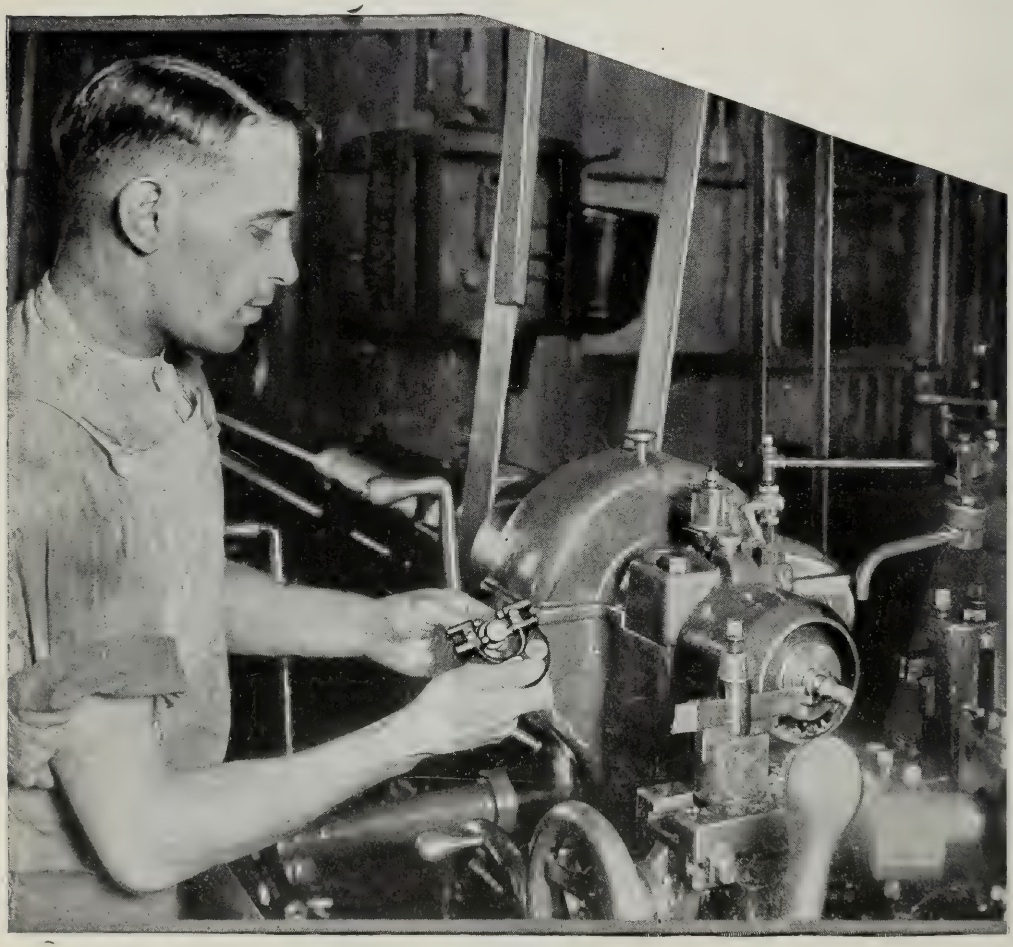

FIGURE I.—Showing the use of the Snap Gage by the workman, in producing duplicate parts in large numbers. The part has just been removed from the lathe and passed between the "Go-Contacts" and intercepted by the "No-go" Contacts.

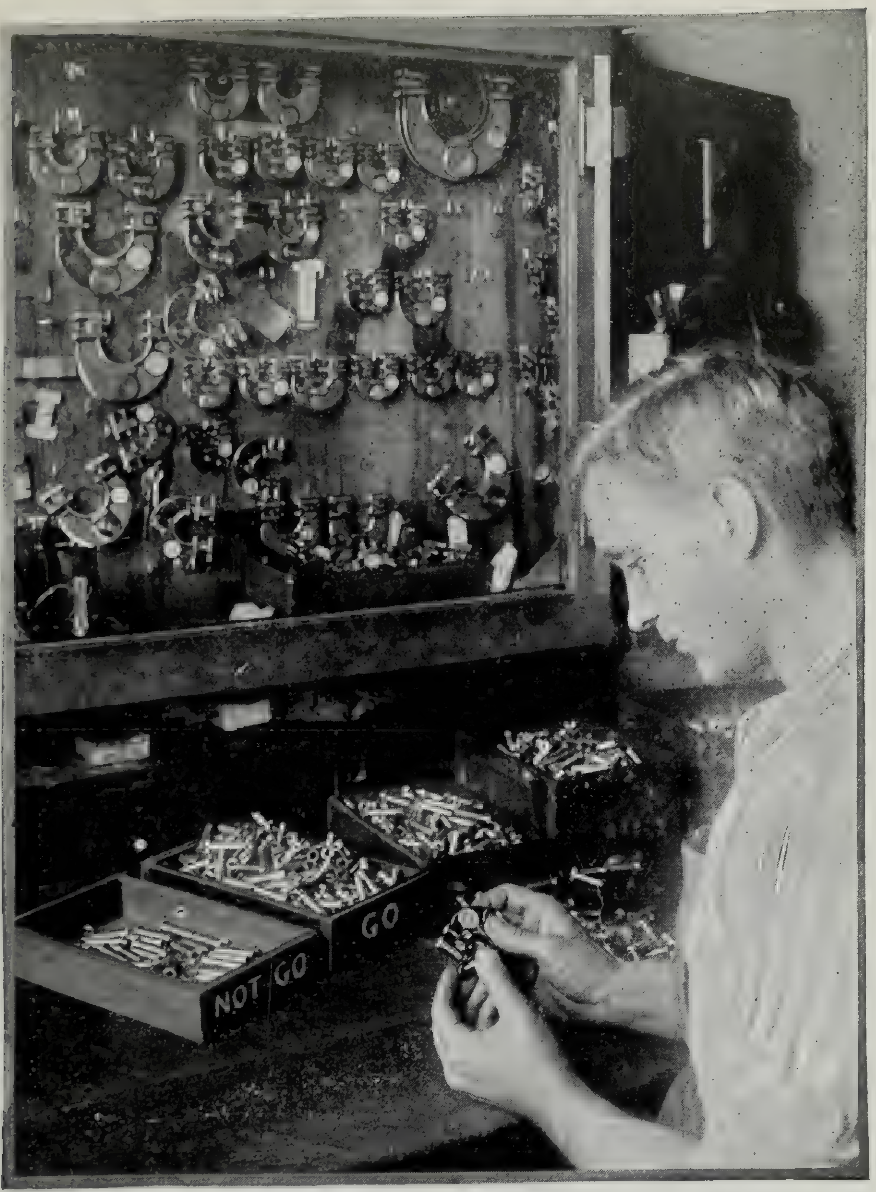

FIGURE II.—Also shows the use of the Snap Gage on a large number of parts in the inspection department of a large plant. A number of sizes of Snap Gages are seen in storage.

many instances reset for production purposes. In view of the large number of parts to which they are applied during the course of the manufacturing day and for this purpose has been developed recently by a Swedish tool-maker, Carl Edward Johansson, a series of solid blocks, made in sets, of slightly increasing size, with amazing characteristics of accuracy of surface and dimension which forms the subject matter of this article.

Recently the writer, in company with Professor G. R. Anderson, Professor of Applied Dental Physics at the Royal College of Dental Surgeons and Applied Engineering Physics, Engineering Faculty,

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NOTE.—The thickness of the cutting edge of a fine razor, one two hundredths part of the width of a human hair and half a wave length of light, will convey some idea of the dimension of 1/100,000 of an inch.

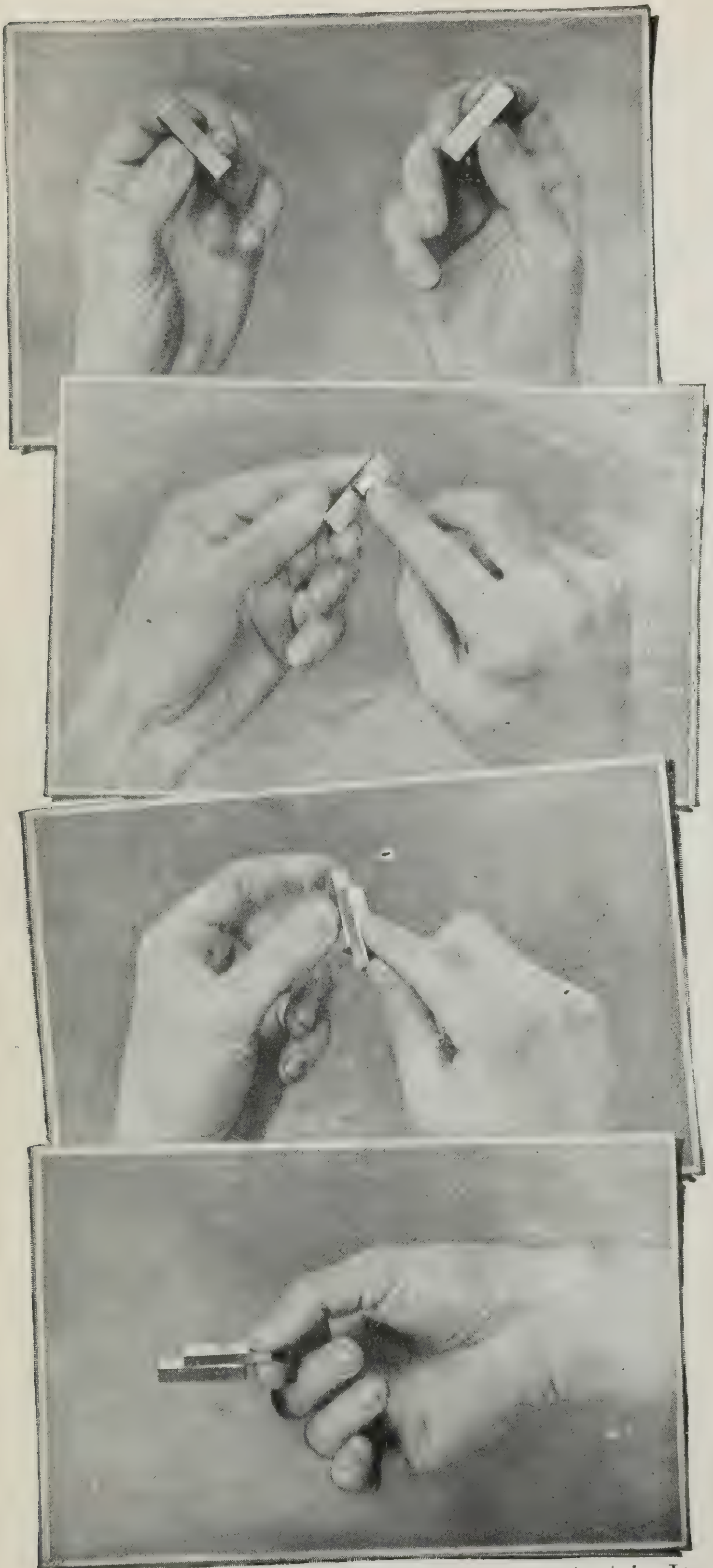

FIGURE III.—Steps in producing close contact in Johansson blocks. The surfaces first cleaned by drawing across the inside of the wrist, then slid crosswise together, then draw around in entire relation as shown above. This having been accomplished, due to their accurate surfaces, these blocks take hold in a remarkable manner.

University of Toronto, were given, through the kindness of Mr. M. J. Horsey, the Canadian representative of Mr. Johansson, the rare treat of a practical demonstration of the amazing accuracy and corresponding properties of these little blocks. To the dentist, perhaps, the most remarkable and applicable (even if remotely) feature is the molecular attraction (as shown in *Figure* 5). When these blocks are slid together, a force as high as 220 pounds is required for separation. This may be said to show very nearly in perfection adhesion and accuracy with which we, as dentists, strive in degrees—alas! sometimes far from perfection, in fitting full dentures to the mouth, which is, in a remote sense, a parallel.

Other remarkable, and to the lay mind, almost unbelievable manifestations of accuracy

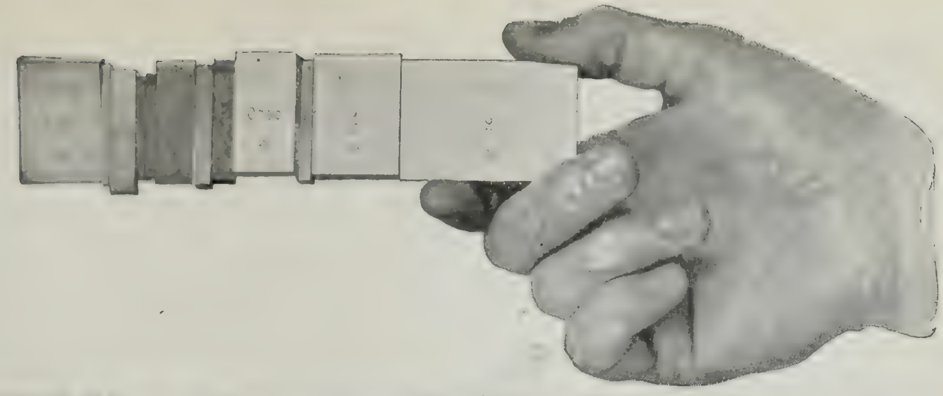

FIGURE IV.—An instance of the remarkable adhesion between the Johansson blocks when assembled, as in Figure III., and held horizontally.

were shown by Mr. Horsey, which the writer will undertake to describe by quotations from current engineering literature.

During the early years of the development of these standards, Carl Edward Johansson, an unassuming Swedish tool-maker, was employed in the tool-making departments of many of the most famous European manufacturing plants, including the "Mauser" Rifle Plant, and in the year 1889 had charge of making all kinds of gages, special tools and machinery for the Swedish Government "Arsenal," Eskilstuna, Sweden. Quoting an article on this subject in June number of the "Inspector," by Mentor:

> "It was at this time that Johansson evolved the idea of making the least number of gages whereby the greatest possible number of sizes could be obtained.
>
> "The problem was a great task, but nothing could discourage him in his untiring efforts. The slogan: 'If it is easy, it is not for us,' inspired him in his work. He solved the problem step by step. First he made flat surfaces. After this process was completed he solved the second step by making two flat surfaces parallel. The third, he made two flat surfaces parallel and a certain distance apart.

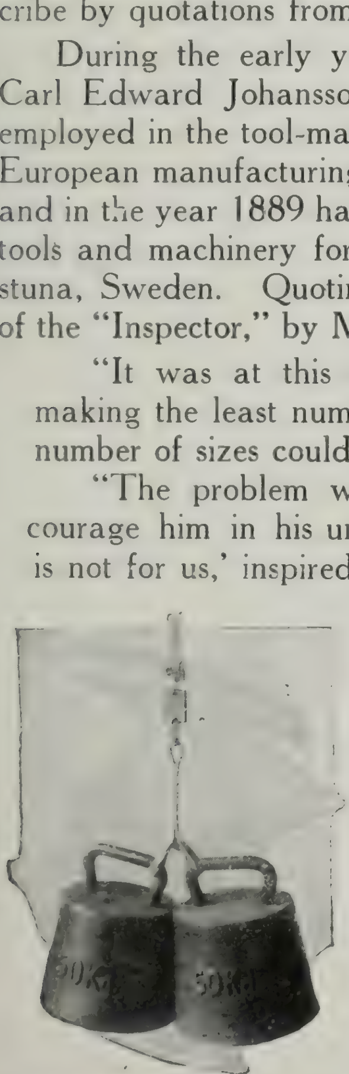

FIGURE V.—Shows the loading of the Johansson blocks, slid together, as in Figure 3, without any medium between and resisting a load of 220 pounds.

> "In order to eliminate the multiple error in the blocks when they were combined, Johansson realized that he had to depart from all present measuring devices depending on the screw or human touch. Neither could he make use of optical instruments or light interferences. He succeeded in constructing a device whereby he could measure the greatest inaccuracies. With this device the blocks could be measured so accurate that when two or several

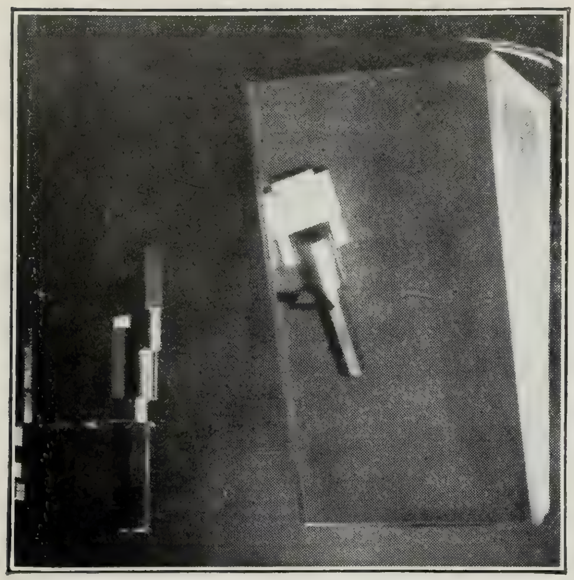

FIGURE VI.—Shows the remarkable fineness of the Surface of Steel, as obtained by Johansson's process. Shows the image of a plug gage, held before this mirror-like surface.

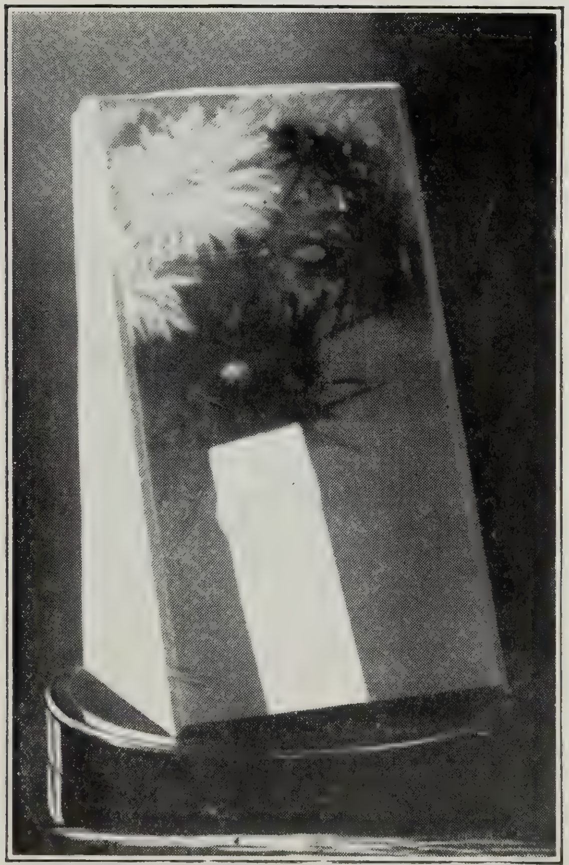

FIGURE VII.—Image of vase of flowers held before surface as in Figure 6. This magnificent piece of steel was presented to Johansson by his workmen on the occasion of his birthday several years ago.

blocks were combined the combination would not show any multiple error, but was found to be self checking. Now, after solving these three problems, Johansson had the first combination set ready in 1897, but the most difficult part remained to be solved, namely, the treating of the steel so as to bring the molecules at rest in order to eliminate expansion or contraction regardless of time.

"This last step took more time than all the previous together. For nine long years, Johansson experimented in treating steel, and in 1906 he had succeeded in making the first combination set which could be guaranteed in accuracy to one hundred thousandth part of an inch."

Johansson Gage Blocks are rectangular pieces of Swedish Tool Steel, hardened, ground and lapped, assembled in sets of gradually and accurately increasing thickness, and embodied in themselves the following:

1. Flat surfaces.
2. Parallel surfaces.
3. Accuracy as to dimensions.
4. Heat treatment and "seasoning," (Molecular rest)

With regard to flat surfaces found in Johansson's Blocks, and the method employed in building up combinations of these blocks for daily use, the blocks are chosen from the sets, the sum of which represents the thickness desired, and slid together, forming practically a solid block, and the amazing adhesion between the flat surfaces of these blocks, which represent a highly specialized instance of a similar phenomenon resulting in the adhesion of upper and lower dentures to the mouth, is the particular feature which excites the wonder and admiration of members of the dental profession and of all others who honor and admire superb craftsmanship.

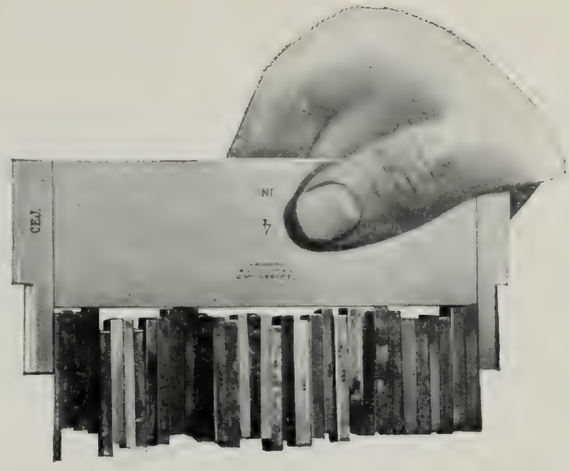
FIGURE VIII.—A remarkable illustration of the accuracy of Johansson block. 34 small blocks have been slid together, the sum total of which sizes is 4". Across their ends are slid a pair of flat surfaces, and between these flat surfaces a solid 4" block is placed. The accuracy is so extreme that this whole mass of 37 pieces of steel are bound together by adhesion.

Figure 3 shows three successive stages in bringing together Johansson Gage Blocks, quoting from the literature issued with the blocks, the process is as follows:

"The blocks needed to make up a given size are selected from the set and the lapped surfaces of each wiped across the palm of the hand or the inside of wrist. They are then brought into contact and with a slight pressure slid one on the other in a manner to expel the air between the surfaces. When the surfaces are free from foreign mat-

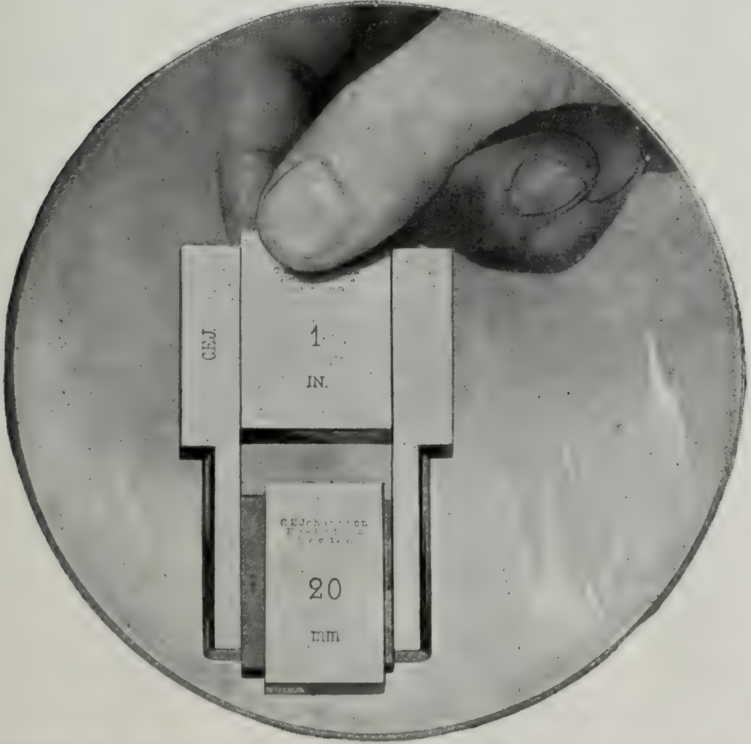

FIGURE IX.—Another instance of the accuracy of the Johansson block. Three blocks of the Metric denomination, aggregating 25.4 m.m., checking against a one inch block.

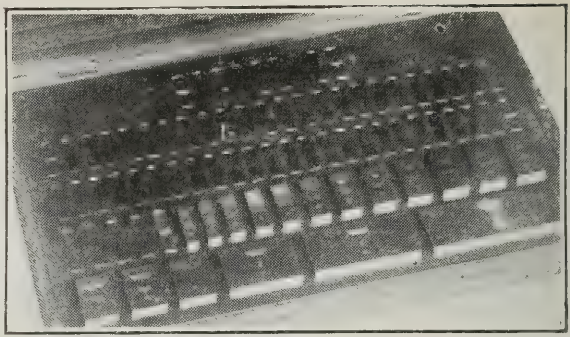

FIGURE X.—Complete set of Johansson blocks.

ter, the blocks will 'take hold' in a most interesting manner.

"The 'feel' of the blocks in contact is much like that of strongly magnetized steel. They may be slid on each other and turned end for end without fear of their falling apart—in fact a very decided effort is necessary to separate them. Two or more blocks so combined may be regarded as a solid piece.

"Scientific men have offered various explanations of what holds the blocks together. The following have been advanced—atmospheric pressure, molecular attraction, and the presence of a very minute liquid film on the contacting surfaces. In truth, it is doubtless due to a combination of all three. That this last has its influence seems proved by the way in which the blocks adhere when wiped across the skin. Tests of their sticking quality have shown that it is due to something more than atmospheric pressure alone, for as much as 220 pounds has been supported by a pair of blocks in contact. The longer the blocks are left wrung together, the greater is the adhesion. In use, it is recommended that they be separated from each other at the end of the day. The piling of block upon block in no way affects the accuracy of the combination. The size so built up will be found to be equal to the sum of the sizes marked on the blocks used."

Figure 4 shows the remarkable adhesion of a series of these blocks, when held horizontally in space in the hands and amazing manifestation of the adhesion between these blocks is shown in *Figure* 5.

At a lecture held on the 10th of November, 1917, in the Stockholm Technical Institute, at Stockholm, Sweden, before the Physical Society, Johansson personally demonstrated the adhesion of two of his standard gages, a pair of millimetres blocks with contact, approximately, ⅜ of an inch by one inch, which were placed together and suspended as shown, with a pair of weights of approximately 220 pounds which was resisted by the

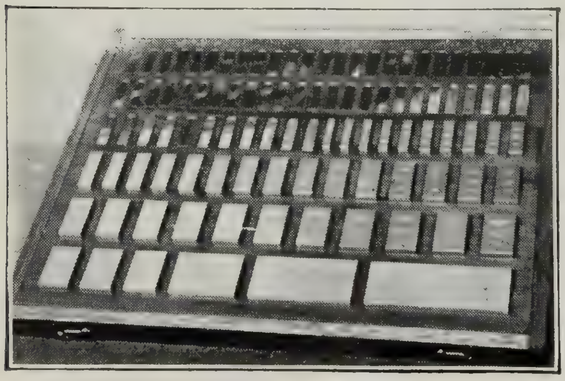

FIGURE XI.—Another series large set of Johansson blocks.

adhesion of these blocks. In the mind of the writer, it is difficult to find a more striking illustration of accuracy of craftsmanship and also difficult to find in an inanimate object a greater inspiration for dentists for accurate application, as relating to denture instruction which the above partially corresponds.

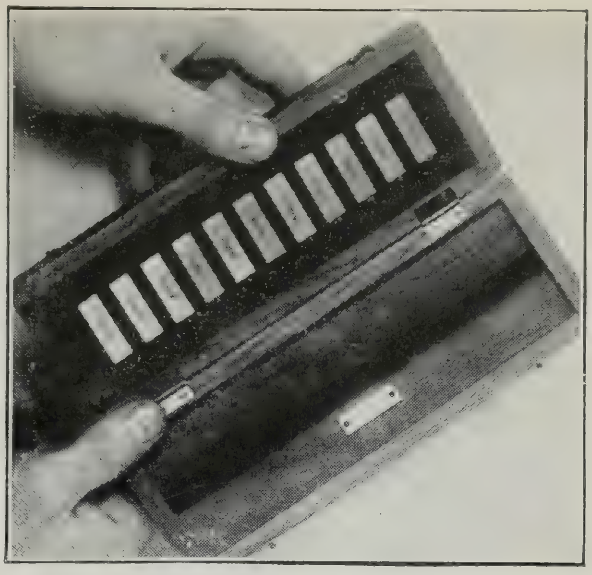
FIGURE XII.—An interesting set of blocks, in which each block is 1-100,000 of an inch more than its fellow and claimed to be accurate to 1-1,000,000 of an inch. These are not handled by hand, but with pliers.

Figures 6 and 7 show in a remarkable manner the fineness of the surface obtained in steel by Johansson's process. *Figure 6* shows the image of a plug gage in a large flat surface of steel which was presented to Johansson on his birthday several years ago by his workmen. The next picture, *Figure 7*, shows the reflection of a vase of flowers in a plane steel surface. It is indeed difficult for a member of the dental profession and others, not conversant with the difficulty of producing approximately accurate steel surfaces, to realize the mirror-like finish of the parallel surfaces of steel and their accuracy as shown in these blocks. With regard to the accuracy of these blocks, which to the lay mind is almost uncanny, the writer will again quote "Mentor" in the June number of the "Inspector," 1919.

Figure 8 is a convincing illustration that the blocks are self-checking or check against each other. 34 small blocks have been combined, the total sum of the sizes of these blocks is 4 inches. They are seen checking against a 4 inch solid block. This illustration tells the story of the accuracy of the blocks. No multiple error is noticeable, although as many as 34 blocks have been combined.

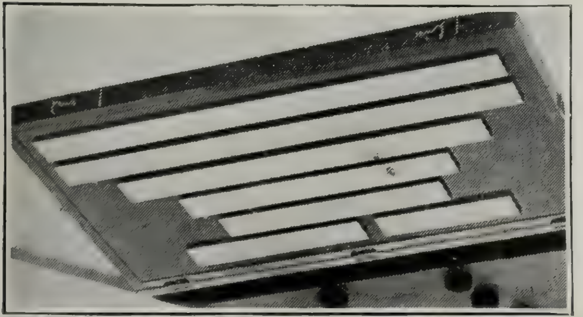
FIGURE XIII.—Set of long blocks. The longest block is 20". These long blocks are remarkable in the difficulty experienced in maintaining their straightness and parallelism.

Figure 9 illustrates the interchangability between the English and Metric Systems of measurements. The equivalent of an inch, which is 25.4 m/m., is being checked against a one-inch block.

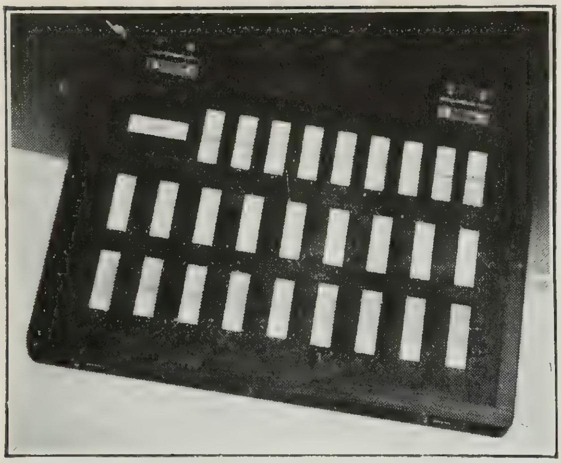

FIGURE XIV.—Set of extra thin blocks. The thinnest of which is 1-100 of an inch. This is extremely difficult to make on account of its thinness and difficulty in overcoming warpage.

This set of Gages was checked by the Bureau of Standards, Washington, D.C., and each Gage proved to be within 0.000004, (four millionths of an inch), according to the methods used.

Figures 10, 11, 12, 13 *and* 14 show the various sets in which these blocks are furnished. Again quoting "Mentor" in the June number of the "Inspector," 1919:

"*Figure* 12 is a set of blocks, each block varies only .00001 inch. The sum of the difference of all the blocks is only .0001 inch. These blocks can, of course, not be used for any practical purposes; however, they are of interest to science. Johansson has made these blocks whereby increments in .00001 inch and guaranteed to .000001 inch to show the mechanical world how fine and accurate he can measure.

"*Figure* 13 is a set of long blocks to increase the range of number one set. The long blocks are being made in sizes 5, 6, 7, 8, 10, 12, 16¾ and 20 inch. Anyone who has had anything to do with the treating of steel can appreciate the difficulty in controlling the expansion and contraction in steel when made into size blocks as long as 20 inch.

"*Figure* 14 is set number four containing 28 extra thin blocks. This set is really an addition to the set number one for obtaining sizes below .200 inch. With this set sizes in .0001 inch can be obtained down to .040 inch. Your attention is called to the block .010 inch. This is the most difficult block to make on account of its thickness in order to maintain straightness and parallelism."

The methods by which these blocks may be made in Eskilstuna, which is inland, shipped to the coast of Sweden, and in spite of this, heavy ocean freights, import duty, and profits to selling organ-

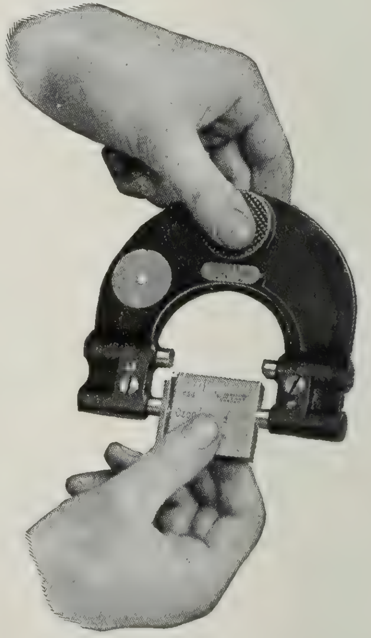

FIGURE XV. — Showing the most frequent use of the Johansson blocks, in interchangeable manufacturing. Setting the Go-Contacts of a Snap Gage, by the blocks. In plants, where the production is large and a large number of parts pass between these contacts, it is necessary to reset these every two days.

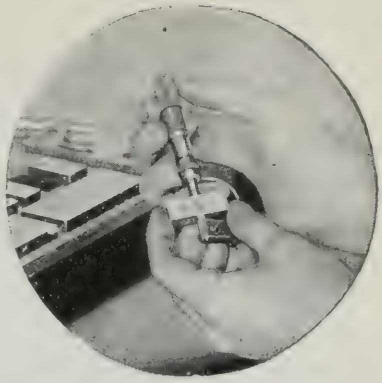

FIGURE XVI.—Checking a micrometer by the blocks.

izations, *sell in Canada, each block,* at a price equivalent to ten hours' time* alone of the highest paid mechanic, are of interest. Johansson has shared his secret with a very small number of confidential associates, without even such as a "scrap of paper between them," and in the factory, the blocks pass from the main factory to the "secret room" in which the finishing takes place and the exact methods used are the cause of a great deal of speculation on the part of those outside.

"An interesting little story might be related here about an American who visited Eskilstuna. One evening he attended a dinner party and had the pleasure to be seated next to Johansson. During the course of the dinner Johansson expressed his sincere appreciation and gratitude to our American friend for making such a long journey, of 3,000 miles, over the Atlantic Ocean, to visit 'the Swedish blacksmith' and his friends in the little city of Eskilstuna. With all the splendor of Swedish hospitality and courtesy, he expressed the wish to be happy by showing his appreciation of the American's visit in granting

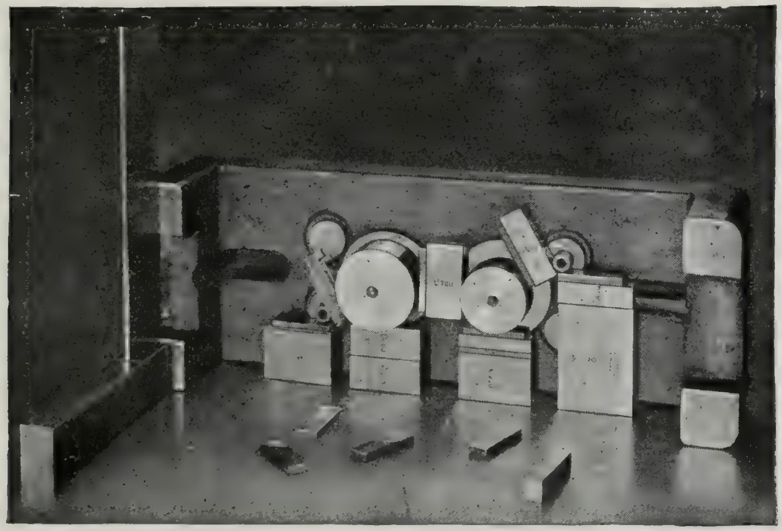

FIGURE XVII.—Use of blocks in setting distance of holes in a drilling jig for production manufacturing.

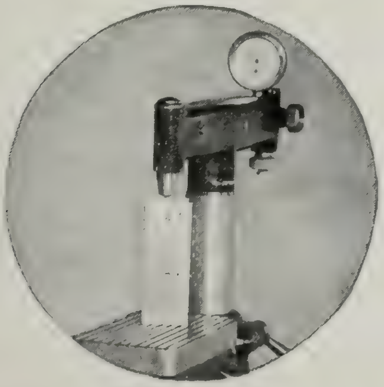

FIGURE XVIII.—Checking an amalgam micrometer by the blocks.

*Refers to each block.

any request which our friend might make. 'What can I do for you to make you very happy and to show you that we truly appreciate your visit to our country. Ask any favor and it shall be granted.' Quick as a flash and with the typical American sense of humor, our American friend said, 'All right! Tell me what you use in your secret departments to make your Standard Gages?' Johansson never hesitated, 'All right!' said Johansson, 'I will tell you: Use lots of patience.' "

The main use of these blocks in the Industrial Art is that of checking the accuracy of various gages, jigs, fixtures, etc. *Figure* 15* shows the manner in which this is accomplished with the "Johnny Blocks" as familiarly called in the shops. Micrometers are frequently checked also by these blocks: *Figure* 16, showing this process applied to the checking of a micrometer. *Figure* 17 shows the use of the Johansson gage block in setting distances of holes in a drill jig. *Figure* 18 shows their use in checking an instrument similar to an amalgam micrometer.

For the investigation and study of adhesion, as applied to Dentistry, and for the checking of fine apparatus and for other uses, as may be developed from time to time, the Royal College of Dental Surgeons has installed a set of these blocks in the College building.

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*Checking a Tolerance Snap Gage.

Cast Clasps*

BY F. EWING ROACH, D.D.S.

Professor of Partial Denture Prosthesis, Chicago College of Dental Surgery.

[*Due to pressure of other matters, Dr. Roach was unable to revise the official stenographic report of the meeting. We are indebted to a colleague for the revision of the manuscript. Readers are asked to bear this fact in mind, the lecture having been delivered without notes*—EDITOR.]

REFERRING to clasps, and classifying them into two classes—the cast clasp and the wrought clasp—we will set aside the wrought clasp for the reason that time will not permit of the discussion of both, and in the belief that the cast clasp is the more important of the two, I shall devote my entire attention to that of the cast clasp.

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* Lecture delivered before Toronto Dental Society, December 1st, and Hamilton Dental Society, December 2nd, 1919.

I want to refer to a few of the fundamental principles which underlie the application of the cast clasp. In the first place, we believe that a clasp should fit the tooth accurately, should be rigid and strong. That is the first principle. Then, if we have that kind of clasp, we believe that the clasp must be definitely held in that position by some means of occlusal rest or stay that will prevent the moving of the clasp—so that one principle calls for the other. The third principle we should observe is that these clasps shall be so accurately assembled in their relation to the saddle to which they are attached that there will be co-ordination between the saddle and the clasp in bearing the stress that will be brought to bear upon the clasp. Coordination, then, is the third principle. Then, again, we believe these clasps should have a reciprocal bearing on the tooth under all circumstances. The clasp should so envelop the tooth as to supply reciprocally opposing the force, one side of the clasp against the other. These clasps must have a reciprocal bearing on the tooth, if they are to be of any value. In addition to that, then, another principle is that the clasp must be designed so that it rests upon the enamel of the tooth. Never should a clasp of any type rest upon the cementum or upon exposed dentine, but on enamel surfaces at all times.

Another important thing that we should not lose sight of,—in having a clasp that fits the tooth accurately in one place on that tooth, that clasp must be handled intelligently. It must be made so that it is smooth on the inside, next to the tooth, remembering that the casting under all circumstances, without exception, has upon the surface when brought from the machine a very fine abrasive (from the investment) which must be polished off, or you will have mechanical abrasion of the tooth to which it is attached.

The clasp should cover as large a surface of the tooth as possible, believing that the wider the space they cover the thinner they can be made; and also grasp the tooth better, covering a large area. Then if not made so that they can be kept clean, and the patient instructed in regard to keeping them clean, you are going to have rampant decay.

Now there are some very common objections made to the type of clasp I am advocating. First, that you are going to have damage brought about by decay, mechanical abrasion, and torsion. Those three are very destructive forces applied to the tooth to which you are attaching. I grant this, and concede these objections to be perfectly logical ones against the cast clasp; but in spite of that, I am a believer to the extent that I am using this clasp under all conditions in mouths of patients who are coming to me. Knowing as I do that there is danger, I take the precaution to see that my patients understand the danger, and instruct them so that they will know how to take care of this appliance. I look upon this clasp just as I look upon all things that are dangerous. Fire is dangerous; railways, automobiles, flying machines—all are dangerous, unless intelligently understood and properly controlled. Are we going to pass up the best possible methods to-day, in regard to partial dentures taking the place of the fixed bridge, in a very large measure? Are we going to throw up our hands in holy horror and refuse to have anything to do with them, simply because they are dangerous if not intelligently handled?

I believe the majority of the profession do not begin to appreciate the possibilities of the cast clasp. The larger they are, the more surface they cover, and the more securely I can fasten them on the teeth, the better satisfied I am.

As to mechanical abrasion of teeth through the clasps, I cannot see it at all. I have gone through all kinds of tests in connection with decay, abrasion and erosion, and it has been my conclusion that for the damages occurring through these three sources the clasp has not been responsible in any appreciable degree, and the results have not been chargeable to the cast clasp, for the reason that the cast clasp, accurately fitted on a tooth, has no up and down movement.

There has been a lot of damage from clasps, and a lot of decay and damage from fixed bridges and a good many other things. I am a champion for the cast clasp serving our best means for partial dentures—less fixed bridge-work, less attachment cases. I am the inventor of a little attachment, and I am not ashamed of it; but I am opposed to this kind of practice where it can be avoided. Put a clasp on that tooth, carry it along until you *have to* put a crown on. Put a good clasp on, instruct your patient how to care for and watch it; watch it yourself, and if you notice decay setting in around one of these clasps, get out your silver nitrate and blacken it. Do your part, and see that your patient does his.

These are a few principles that I want to leave with you in referance to the clasp. Do not believe the statements you hear about mechanical abrasion, but make a small clasp metal wheel for your mandrel, put it in your handpiece, and revolve it against the enamel of a tooth moistened with water. See how long it will have to run before you can make an impression on the enamel of the tooth. When it does occur in the mouth, it is chemical, and not mechanical.

See that your patient understands the importance of keeping the clasp clean, and put the responsibility at his door. If you notice any susceptibility to decay, have him leave the appliance out at night. If cleaned once or twice during the day, and left out at night, you can depend you are not going to have any trouble with the cast clasp. It will prove to be a most satisfactory means of anchoring partial dentures.

We are going to take from the cast clasps three types for our consideration this evening. There are possibly half a dozen or more different forms that I would put into the cast clasp classification, but from that number I am going to take what I consider the three types which are the most useful, and that cover practically the entire tooth. We will consider the mesio-distal clasp for anterior teeth; the embrasure grip combination for the bicuspids; and the bucco-lingual contour clasp as applied to the molars.

Mesio-Distal Grip Clasp—In the application of the cast clasp to the anterior teeth, the clasp that grips labio-lingually is not a good clasp. The natural form of these anterior teeth is often unfavorable in presenting opposing convexities.

The mesio-distal clasp protects the gingival area. We have to reduce the contour of the tooth slightly. Do not be afraid because you are going to cut the enamel a little bit. Most of us are a little afraid of these new ways of doing this, and you may feel timid about this matter of removing the enamel and destroying normal contact. You do not have to remove much of the contour of the tooth. The Joe Dandy disc, a safe sided disc, was suggested by Dr. Roach. Just straighten it up a little and make space enough for your clasp to pass in between the teeth. Many of them are so straight that they hardly need touching at all to prepare them for the mesio-distal clasp, and you can depend upon this to hold the appliance in place as no lingual clasp can do. You see only the edges of this clasp as it passes around the labial, and they look like gold fillings. The cosmetic effect is very, very acceptable, as compared with clasps that grasp the tooth labio-lingually.

In the *Bicuspid Embrasure Grip Clasp* the wire addition to the casting makes a clasp that is more flexible. Minimize cutting wherever possible by using the embrasure grip. The reason for the use of this is to avoid cutting between the teeth. In cutting between these teeth, you replace it with the clasp, and the contact is there in metal, rather than on the normal tooth.

Direct Method of Casting—With the cast clasp, particularly by following the direct method of making these clasps, you have an unlimited variation, because you duplicate the wax impression on to the model.

If we are going to follow the direct method—and I believe implicitly in the direct method of casting directly on to the model—I run up my impression by investment compound (made by Weinstein), or take any good investment compound and add 50 per cent snow white plaster Paris, and cast directly on to the model of the tooth—rather than making a metal model, removing the wax, and trying to get all the parts assembled. I cannot take advantage of the same engagement of the contour of the tooth—run up my impression carefully, so that I have an exact impression, run it any place on the tooth, and cut off any excess.

In attachment for the anterior teeth, the mesio-distal clasp is the missing link in clasp construction. I never practised dentistry, in all the twenty-five years I have been in practice, with the same degree of satisfaction as by following the use of the cast clasp technique as I am using it to-day, and the thing that has given me the most pleasure is this mesio-distal grip clasp. To those of you who are not familiar with its use, I want to say you are missing one of the most valuable assets of dentistry.

We must cut between these teeth and reduce the contour slightly. Do this with a Joe Dandy disc. Round off labial and lingual angles so that you restore the tooth to its normal rounded surface. If you do not do this, you will have a clasp that is very much more bulky and very much more conspicuous.

I have one of these clasps in my own mouth, and have been wearing it for two years. Seeing boxes of models in glass cases does not prove much; the proof of the pudding is all in the eating. I have been eating with this clasp, and sleeping with it, for two years, and my estimation of it increases as the days go by. I have the new No. 3 form of the Roach attachment on this piece. However, I did not come to you with the intention of talking to you about the Roach attachment. I do not want to be dubbed "The Roach Attachment Man." While I am not ashamed of the Roach attachment, I consider it the smallest part of the work I am trying to do in partial denture work.

If I brought nothing more to you than this mesio-distal grip clasp, if you could take the principle to heart and get the satisfaction out of it that I am getting, I would consider my time in Toronto well spent. I believe that most of you will live to see the day when you will feel kindly toward the mesio-distal grip clasp. I do not know how many of you are using this clasp, or are familiar with it. You may have used it long before I did; but I am assuming that you have not been using it very long, or have not been getting the results I have been getting, or you would have told us about it.

Impression—Mesio-Distal Grip Clasp—I could spend one whole evening, really, on the technique of making this clasp. Taking the impression and making this clasp is one of the most difficult pieces of work I have ever undertaken. I have only been able to get this result with modelling compound. Take a mass of modelling compound as large as the first joint of your finger, form into a cone with a broad base, and soften it over the flame so that the pointed part of the cone will be plastic and the base cold. Keep in mind getting a full and complete impression of the entire surface of that tooth above the gum. Take advantage of carrying the clasp just a slight amount below the straightened surface of the tooth. This puts the "kick" into the clasp.

The modelling compound is pressed in between the teeth, forcing it both ways. Cut away the excess with a sharp knife until you have the material that comes out labially half-way, so that you can withdraw it lingually. Put it back on the tooth, blow the moisture away to find whether you have an absolute contact all around the margin, and it is in position. If you have that nicety of adaptation on the lingual half, you force your labial half against that, bring it out, and you have your two halves. If you find a feather edge on the margin of the labial half, that comes into contact with your lingual half, you will know you have an imperfect impression.

Impression for Posteriors—The taking of the impression for the posterior teeth is comparatively simple. Preferably, we take these impressions in complaster. It is more easily separated, and less liable to break the model while separating. Modelling compound takes the best impression if in a place where you can check up and know that you have an accurate impression, but unless in a place where you can do this, use complaster. Surface this complaster with liquid silex, preferably. Take impression in complaster for the anterior teeth with a split tray. It is box-like in form; two of them serve all purposes—one open end tray and one closed end tray. Get your material in the proper consistency, and locate your tray so that the separating line of your tray will be as nearly as possible across the centre of the tooth.

The *Molar Clasp* is simple, with a split tray. With reference to the design or general form of this clasp, there are extreme variations. Most dentists are making a narrow, rather than a broad clasp covering a large area of the tooth. I like them wide, overlapping the tooth wherever convenient.

Frequently we find it necessary, where the marginal ridge is a little high, to use a stone on a great many teeth in making clasps. A very small amount of grinding makes a vast difference in the facility for attaching clasps, remembering that the cast clasp is not a flexible clasp, the limit of elasticity is very low.

I appreciate the fact that these are radical measures, and am trying to do it carefully and conservatively, but I find as the years go by I think more of them than ever. I think too much of, and value the normal enamel surface of the tooth too highly, to carelessly or indiscriminately cut away the enamel.

We now come to the making of the single tooth case with double clasp, or clasp at both ends. The world is full of these cases where only one tooth is out, and perfectly good teeth on both sides of the case. Up to the present time I have not been able to satisfactorily do these cases. Only in a few instances have I been able to supply these cases with a fixed bridge.

Many of these cases have been standing so long that all damage which could occur has already occurred. We know full well the damage which occurs from the loss of one tooth—a first molar, for illustration. Occlusion and bad relations of contact rapidly appear. I believe that it is our duty, where we see normal occlusion, and feel called upon to extract those teeth, to put in a restoration to hold occlusion, and when it can be done so simply I do not believe we should say we will pass them over and take chances on the damage which may occur from the shifting of those teeth. Be sane and sensible in the choice of cases. What is the requirement in this work? If you have only one tooth to supply, your work is simplified by taking the impression of those two teeth, waxing the model, and casting in one piece. Do not depend upon the saddle for mastication—which is only little better than the dimensions of the base of the tooth.

Simplifying the construction by casting all in one piece is a very important consideration. To make them in sections is a complicated procedure, making it very much less desirable than to take the impression in one piece and cast in one piece. To get an accurate impression, with the occlusal surface, the contact surface, or the proximal surface, and the lingual and buccal surface of those teeth, by the old way of taking the impression full size, enveloping the entire part, it is difficult, but by taking the impression in the way we are taking them we will pre-determine the line of separation and have the two halves of the impression in just two pieces. Use a half tray only, so that when the material is down in place we can take an instrument and cut away the excess that is forced out buccally. Build up the buccal surface in a mass large enough to give you an impression of buccal proximal of the teeth and gingivae. We want an accurate impression of conditions, so that when I have it on my model I can design and eliminate the under-cut according to what I have before me. I use a parallelometer and parallel as much as I can the surface of the tooth. Take the impression. Use the parallelometer again and see how much of impression still lacks paralleling. If you find you still have an undercut that you have not been able to eliminate, you can still, on the model, make an undercut with the instrument and fill this up with investment compound, and see that approximating surfaces are parallel. Make casting, avoiding mutilation of teeth at contact points. Appliance fits in, leaving a V-shaped space such as nature had there in the first place, which is desirable and advantageous.

The principle I follow in making castings of all these larger pieces is to cast from one sprue, from one end, so that all of the wax pattern in the investment acts as a passage, taking advantage of the law of physics to help me get that gold in.

I neglected to say that the mesio-distal grip principle can be applied to molars and bicuspids, providing these teeth stand alone; the natural form of the tooth is more favorable to mesio-distal grip than to bucco-lingual.

Now we come to the uni-lateral construction. These cases have been puzzlers, like many others. Suppose you have all teeth out back of the first or second bicuspids. It is not always advisable to supply these by means of the plan I will outline, but in a great many cases some of the most satisfactory results have been obtained through this uni-lateral construction.

My belief is that to make a success of this we must have, first and most important of all, a good firm, well defined, fully absorbed alveolar ridge. In addition, we must have good strong healthy teeth to clasp, and at least two of them. Another favorable condition is a short bite, rather than a long bite, and next a partial denture in the other jaw. With these cases properly constructed, my experience has been most satisfactory. They should be made by sections, separate units, taking impression of the teeth to be clasped, and making clasp with embrasure grip as a separate unit. Take impression of saddle, cast, then with saddle in position in the mouth take impression of the saddle and clasp with the saddle under compression.

As a means of securing this compressed relation, the plan I have recently employed, and that has given me the best satisfaction, is to take a large piece of metal, half an inch wide, cut a straight strip, and if just a uni-lateral case, bending it over then at right angles to the horizontal plane. With that held with your thumb and finger resting on anterior teeth, get it into position, have your assistant take plaster paris and fill in the box-like space, to get an accurate impression, while holding part under pressure.

I appreciate very much indeed your kind indulgence, and want to say the story is only half told, but I have done the best I could in the time at our disposal, and want to thank you for your kind attention.

DISCUSSION.

Dr. Ante: I am sure you will all agree with me that the technique and detail that has been presented here to-night is not only the work of a dentist, but of a genius.

Dr. Roach has modestly shunned the attachments that he has on the market, which are filling a great need in our profession along the line of partial dentures and removable bridge-work.

At a time when partial dentures were being scorned by our patients, Dr. Roach came to our aid and introduced the Roach Attachment No. 1 (the ball and socket). There are still a great many cases where the No. 1 Roach can be used to good advantage.

We must not discard this attachment entirely in favor of the cast clasp, especially in cases where its use is indicated, as for instance on teeth that are devitalized, crowned, or where restoration is made by inlays.

A few years ago, when the wave against fixed bridge-work swept over America, Dr. Roach again came to our assistance and introduced the Roach Attachment No. 2, which rapidly came into prominence. Crowns or inlays are necessary for their attachment, but in cases where conditions are favorable there is nothing to equal them.

The teaching of to-day is to conserve tooth tissue, and under no circumstances devitalize. With the different forms of work, attachments and modern appliances, along with the different types of cast clasps presented to-night (namely, the mesio-distal clasp for anterior teeth, the lingual embrasure clasp for bicuspids, and the bucco-lingual clasp for molars), we have no excuse for the needless sacrifice of tooth tissue in the future.

There are a great many points which Dr. Roach has not had time to touch on to-night. He simply mentioned the fact that there was a special tray for taking the impressions of the teeth for the clasps. These trays are on the market, known as the Roach Trays. There are two types, one for teeth standing alone, and the other for teeth in a series. They are very ingeniously made, and practically eliminate all the trouble we have had taking impressions with the ordinary crown and bridge trays.

Care should be used in taking the impression of the teeth. Mix your "complaster" very thin, fill the tray with same and insert into the mouth with a waving motion, so as to make sure that the plaster reaches all the small spaces and concavities around the tooth. Have the tooth sit in the centre of the tray, and do not force up until the tooth touches the bottom of the tray; in other words, have an equal thickness of plaster on all sides of the tooth. Be sure to split the tray in half before removing from the tooth. When removed, see that the tray and parts are closed tightly together before flowing in investing material. When separating, care should be exercised so as not to mar in any way the form of the model.

With a pencil trace the outline form of the clasp on the model, making sure to have the clasp cover two opposing convexed surfaces. Cover this line with a strip of thin wax (Kerr's 26 gauge), and with a sharp penknife trim to outline form, reinforce to desired thickness with inlay wax, insert sprue, invest, heat and cast.

Sometimes on upper second molars the opposing surfaces are fairly parallel, making it impossible to properly adapt a clasp. With a small stone cut a slight concavity on the buccal and lingual surfaces at a point where the enamel is thick. This forms a concavity for the clasp to grasp into.

It is possible to buy the metal for casting at any of the dental depots. Most of the local manufacturers are making very good casting clasp metal.

I wish to compliment Dr. Roach on his work. He has given us a technique that is simple, which anyone can follow, and with little effort can carry a case through to successful conclusion. It is a work that will and is rendering a great service to humanity, and something that the dental profession needs more of.

Dr. Mason: I wish to draw attention to one feature of the evening—the first feature Dr. Roach presented to us. The mesio-distal clasp on anterior teeth seems to be very satisfactory for certain cases. For my part I appreciate most the first features of the paper. In the latter part I can see difficulties looming up. However, a few years ago when Dr. Roach was here he gave us a splendid evening on the Roach Attachments, and we have all used them, with great satisfaction to ourselves and to our patients.

I desire to take this opportunity of proposing a vote of thanks to Dr. Roach for coming here and giving us such an enjoyable and profitable evening, and hope we have not tired him too much.

Dr. Willard seconded the motion, which was carried most enthusiastically.

Dr. Roach: I appreciate this expression very much indeed, and thank you for the kindly way in which you have received my message. I do not intend to take any more of your time in discussing the matter before us. It is too big a subject to try to cover in such limited time, and I was glad to have the points brought out and emphasized which were brought out. Much additional time might be spent in discussion, which would bring out valuable points, but with an expression of my high regard for the acquaintances and friendships I have made in Toronto I must close. I shall always remember it as a pleasure to have come before you again, and assure you that I appreciate your courtesies and attention.

Dr. R. D. Thornton, president of the society, was chairman of the meeting.

Canadian Army Dental Corps and Returned Soldiers

THE Canadian Army Dental Corps has a most important task to perform for the Canadian soldiers during the period of their demobilization.

In Military District No. 2 alone, there were examined on discharge 86,115 soldiers from February, 1918, to December, 1919,—a period of one year and eleven months. Of this number 62,514 (72 p.c.) *required dental treatment*, and 13,501 (less than 25 p.c.) have already had their dental needs attended to.

Complimentary Banquet to C.A.D.C., M.D. No.2

R. J. Reade, M.A., M.D., D.D.S.

ON Tuesday evening, January 20th, 1920, there was a notable gathering of Dentists in Toronto. The occasion of the gathering was a reception to the members of the Canadian Army Dental Corps by the civilian dentists of Military District No. 2. The reception was in the form of a banquet given at the King Edward Hotel by the Women's Auxiliary of the Dental Corps. The Women's Auxiliary has been a great source of strength and has rendered valuable aid to the corps. What a thought! These splendid Canadian women rising up in their might and opposing their strength to the force of the Central Powers, fighting valiantly and nobly for their own country. It is a notable part they played in the conflict, for did they not cheer, comfort and nourish a body of men concerning whom General Mewburn says: "It would have afforded me a great deal of pleasure to have been present, and to personally express my deep gratitude for the wonderful work done by the Dental Corps, both overseas and in Canada. Their work has been of a most outstanding character and I do not think there is any unit of the Canadian Militia that has rendered such distinguished service to the men of the corps, and also to the country, as has the Canadian Army Dental Corps."

There were present about two hundred members of the C.A.D.C., consisting of graduates, undergraduates and orderlies. A thoughtful arrangement was made to seat those at the banquet around a number of small tables, and at each table to have civilian dentists act as hosts to members of the C.A.D.C. By this happy arrangement all the guests were entertained.

Dr. F. C. Husband acted as toast master, and at the head table with him were: Mayor Church; Col. John I. McLaren, A.A.G.; Lieut.-Col. W. G. Thompson, A.D.D.S.; Lieut.-Col. Guy G. Hume; Dr. O'Sullivan, D.D.S., S.C.R.; Dr. Wallace Seccombe, Capt. Joe Thompson, M.L.A.; Dr. A. E. Webster; Dr. Harold Clark; Capt. R. D. Thornton; Capt. Roy Zimmerman.

After the dinner the members of the Women's Auxiliary of the C.A.D.C., who were tendered a dinner in an adjoining room by civilian dentists of Military District No. 2, joined the gathering.

The first toast was The King.

Lieut.-Col. W. G. Thompson proposed a toast to the women, acknowledging and praising the valuable service rendered by them to the C.A.D.C.

Captain Roy Zimmerman also added mead of praise to the unflagging zeal of the ladies. To this toast Mrs. F. C. Husband fluently and suitably replied on behalf of the Women's Auxiliary.

Mayor T. L. Church proposed the toast to the Canadian Expeditionary Force in words earnest and heart-felt. The toast was acknowledged by Colonel McLaren and Captain Joe Thompson.

Dr. O'Sullivan, D.D.S., S.C.R., addressed the gathering on the subject of Soldiers' Civil Re-establishment.

Dr. A. E. Webster, Dean of the Dental College, was called upon by the toastmaster for a few words.

The last toast to the C.A.D.C. was fittingly proposed by Dr. Wallace Seccombe and replied to by Lieut.-Col. Guy Hume.

During the evening Miss Mary Bothwell and Mrs. Harold Box greatly added to the pleasures of those present by vocal selections.

The general feeling of those present seemed to be that the influence of the evening would probably lead to greater results and efforts than could be estimated at the present time. There seemed to be in the air a sympathetic influence, and all seemed to be desirous of standing shoulder to shoulder to do those things which the future should demand. The great idea was service to mankind. Each one present seemed to learn and feel for the first time as it were, the very important place occupied by dentistry in the world of affairs.

Mr. Jules Brazil added greatly to the enjoyment of the evening by his very acceptable entertainment.

The Value of Systematic Study

GREAT advantages accrue to the man who systematically undertakes a definite amount of study during a given time. It is only by acquiring such a habit that satisfactory progress is made.

Those who are engaged in magazine work find that one of the greatest advantages is that a fixed amount of "copy" must be produced regularly each month. Ordinarily, the task might be deferred to a more suitable time, but "the press" simply will not be denied.

The result is a form of "compulsory exercise." The copy is assembled, the proofs are read, and the magazine is mailed during the month of issue, thus complying with the Post Office regulations, and forcing those responsible for the magazine to regularly and systematically undertake a fixed amount of work. A somewhat similar advantage has been urged in favor of life insurance. It is a form of "compulsory savings." The due date of the premium comes around, and the obligation of necessity must be met.

It is really surprising how much work we can do, when we undertake it systematically and thus acquire the good habit of regular effort. It is not the spasmodic spurt that counts so much as the regular, persistent effort to accomplish a little each day even though it may be only a very little.

Home and School

Devoted to the interests of Dental Health in the Homes and Schools of the Community

This Department is Edited by
F. J. CONBOY, D.D.S., Toronto
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Oral Hygiene and the Press

THE following article, written by Dr. Arthur Day, of Toronto, appeared in the *Toronto Sunday World* on December 14th, 1919, under the caption, "Good Care of Teeth to Ward Off Decay." It contains an immense amount of information which will prove most beneficial to the general public. We are pleased to reproduce the article and sincerely hope that many other members of the profession will follow the worthy example set by Dr. Day:

"We dig our graves with our teeth" in two ways—by using the teeth to indulge too immoderate an appetite, and by neglecting the care of the teeth. "An ounce of prevention is worth a pound of cure," in dentistry. In China, in the olden days, the family physician was dismissed as soon as disease appeared in the household, because it was held to be his particular function to keep the family free from disease by preventive measures. There was an element of good sense in this practice. Where one thousand people go to the dental practitioner to have a cure effected, ten thousand ought to go to have an examination while the teeth are yet apparently healthy.

Cause and Effect.

It is becoming a custom gradually for people to secure advice about their teeth before painful conditions develop, but the practice is still limited to a comparatively small number. It is still true that the majority of people go to the dentist to have teeth extracted or filled, or to get artificial teeth, and most dentists have remained content to perform these services. The habitual neglect of the patients has reacted upon many of the dentists themselves, and they have become accustomed to the diseased gum conditions which are present in the mouths of a vast number of their patients, and have come to overlook to a great extent the seriousness of many of the cases that come under their observation.

The attention of the practitioner is too much concentrated upon the condition of the teeth, and inquiry as to whether they have become decayed. Now we cannot bear in mind too constantly that a majority of the teeth that are lost are lost on account of gum trouble, and this statement applies especially to towns and cities, where teeth are filled with more or less regularity. It would not be an extravagance to say that in such communities one-half of the teeth are lost on account of a neglected condition of the gums. Moreover, it is safe to look to the gums, where poisoning from the mouth has affected the general health.

Anticipating Trouble.

It follows that everyone, without exception, should have a regular dental examination, whether there is any apparent trouble or not. There should be a thorough examination to determine: (1) As to whether there are any cavities in the teeth; (2) as to whether there are any inflamed areas in the gums, and (3) to see if the patient is giving his mouth proper care. Such preventive consultations should be paid for, because they are not only as valuable, but they are more valuable than work that is purely remedial. The dentist uses the knowledge that has cost him years of work, whether it is in a preventive consultation or in actual repair work. Therefore, he is entitled to a fee for either service. A lawyer expects remuneration, and, rightly, too, where advice is given, even if no papers are delivered or plea made in court. There are conditions in the mouth that may cause serious constitutional disease, and a consultation may prove invaluable.

The teeth may present no outward signs of decay, may give no pain, and act as good masticators, but at the same time may be surrounded by inflamed and neglected gums. In such cases the gums should be treated and made healthy or the teeth should be extracted. To give helpful advice in such cases is one of the greatest services that a dental practitioner can possibly render. Surely if the teeth can be saved or if at least the general health can be conserved as a result of advice given in time, a more valuable service is rendered than if a remedy were attempted after the mischief is done.

Deadly Pyorrhea.

Disease of the gums is commonly called pyorrhea, and we should be on the watch for its symptoms—looseness of the teeth, red and swollen gums, discharge of pus from the gums, bleeding gums, elongation of the teeth, recession of the gums, spreading apart of the teeth, etc. It is to be noted that in a very few of such cases is there any pain associated with these symptoms.

Pyorrhea always has an incipient stage during which it is easily cured, but after it has made some progress the bone surrounding the teeth begins to be absorbed and the teeth loosen. If they become very loose the disease has reached an incurable stage. There is another serious result—if the bone becomes too much absorbed, there will remain but a weak foundation for artificial teeth to rest upon—and a poor-fitting artificial set is inevitable.

When teeth start to move or to change their position in relation to one another it is a good policy to have them extracted at once and artificial ones inserted to keep the remaining teeth in their proper places. Like the proverbial "stitch," an operation in time will often save nine.

Food crowding down between the teeth is often caused by poorly shaped fillings or poorly shaped artificial crowns, and this is not only annoying, but it will sooner or later cause inflammation of the gums; and that in turn the loss of the teeth in the affected part. These defective fillings or crowns should therefore be replaced at once. Let us admit that expeditious dentistry which is often practised for low fees is responsible for a lot of gum trouble. Other trouble makers we may mention are floss silk rubber bands, or tooth picks being brought into contact with the gums so as to make them bleed. The use by the patient of medicinal tooth-washes is of no avail where a pyorrheal condition exists.

Unsuspected Pyorrhea.

Probably a quarter of the people in middle life have pyorrhea in an advanced stage. The reason the general health is not always affected is because of the resisting powers of the tissue of the mouth. On the other hand many people have serious ailments that are caused by pyorrhea, but they do not suspect the true cause. Many again in weak health become subjects of a low degree of poisoning which causes a peculiar pallor over the face. They lead lives bordering upon actual invalidism and many in such a case die of prevalent diseases which they would easily have thrown off but for the condition of the mouth and its debilitating effect upon the system.

As a rule people wait until pyorrhea is well advanced and when too late go to a specialist to have it treated; but if it is very far advanced a cure is impossible. The patient should consult in time a dentist who has an interest, not only in filling and replacing teeth, but in treating pyorrheic conditions. As a preventive measure all tartar should be removed from the necks of the teeth and all the surfaces polished, including those impinging upon neighboring teeth.

Prevention.

This is termed prophylactic treatment, and it signifies the prevention of those conditions that induce disease. It is not a new thing in practice. The prevention of yellow fever by the extermination of mosquitoes is a case in point; the employment of diphtheria anti-toxin is another, and the purification of water to prevent typhoid is a third example. Prophylaxis or preventive treatment is the most valuable service the dental profession can render.

As a prophylactic agent the homely tooth brush occupies a leading place. But homely as it is a dentist or a dental nurse can alone give satisfactory instructions on the use of the brush. Properly employed it will help keep the teeth from decaying and put the mouth in a condition of cleanliness. Finally, it is essential to have the mouth examined at least every six months, and prophylactic treatment given, if necessary.

Nothing is more pleasing than the appearance of carefully kept teeth, and it will lend a charm to features otherwise commonplace. On the other hand neglected teeth will hopelessly disfigure a face otherwise attractive. In addition to purely hygienic consideration there is good reason why every self-respecting man and woman should seek to maintain the teeth in a perfectly clean and wholesome condition. The labors of the most accomplished beauty specialist will be entirely in vain if this fundamental requirement is neglected.

Dental Entrance Standards

IT is not enough that professional skill be the only passport into the Dental Profession,—the character of the man should call for some careful consideration also.

To Anaesthetize the Gum Surface Before Insertion of Hypo Needle.—Dry the gum in the desired spot, moisten a small tight pledget of cotton in phenol (merely moist, not wet), and touch the gum with this. Dry the small white eschar thus formed with air blast. Using care and injecting as you go, one can then insert the needle absolutely painlessly. Also the surface is well sterilized.—E. J. C. S. Digest.

The Interproximal Contact Point.—The form of the contact point has much to do with comfortable mastication and the preservation of normal gum in the interproximal space. The contact point on normal human teeth is a small curved eminence on the proximal surface near the occlusal or incisal. From this small contact the proximal surface of enamel slopes away more or less abruptly, leaving the area in actual contact exceedingly small. This holds true of broad teeth like the molars as well as narrow teeth like the incisors or cuspids. The philosophy of this narrow contact relates to the fact that when food is forced between the proximal surfaces of the teeth, as it will be at times, it is not retained there owing to the limited area. If the contact were broad, as we see it on fillings, food particles would be held between the teeth, leading to all the evils associated with this condition.—C. N. Johnson (Dental Cosmos).

THE COMPENDIUM

This Department is Edited by
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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

HEAT AS A CAUSATIVE FACTOR IN PYORRHOEA.

IN a paper recently published by Dr. S. N. Young on "New Ideas in Pathology," attention is directed to the fact that the practice of habitually tolerating contact with very high degrees of temperature through the ingestion of hot foods, is undoubtedly a factor in the prevalence of pyorrhoea amongst civilized people. He points out that the clinical course of pyorrhoea-alveolaris follows exactly the pathological course of fatty degeneration of tissue, with its caseous termination, to which course pathologists give a burn or scald as one of the causative factors. The teeth most exposed to the hot foodstuffs, and vital teeth with large metal fillings which increase the conductivity of thermal shocks are always most extensively afflicted with the disease. In its incipient stage, pyorrhoea will readily yield, says Dr. Young, by avoiding the application of heat above 110 degrees F. Rheumatism may be induced in a non-rheumatic subject under favorable atmospheric conditions and with proper diet, by simply washing the hands a number of times in water at about 150 degrees F.; and inversely by an avoidance of moist heat above a temperature of 110 degrees F., the disease may be cured.

Dr. Young claims that rheumatism is largely due to the coagulative influence exerted upon the nutritive proteid particularly, by excessive moist heat, and is found most frequently amongst people who are accustomed to having their hands in hot water, and who by want of proper exercise, or atmospheric conditions necessary to bring about profuse perspiration, retain the injurious products in the system.

In diabetes-mellitus, high temperature is a pronounced causative factor due to the destruction of the ptyalin ferment by heat. Other factors associated with this disease are the ingestion of foods of the diabetic sugar formula, such as candies, sugar and like commodities in such excessive quantities that natural dehydration cannot take place; and the ingestion of beverages containing the same formula which it is impossible to insalivate. The ptyalin ferment is necessary for correct digestion of this class of food in all cases; and if its destruction is brought about by heat, the contention that food of high temperature is one causative factor in diabetes would appear to be justified.

The temperature of man and of most mammals is 98 degrees F. to 99 degrees F., and this would seem to be the proper temperature for our food. At 140 degrees F. the destruction of digestive enzymes and proteid bodies begins and taking 150 degrees F. as the point at which most of our hot food is ingested, it follows that serious interference with the digestive functions necessarily results. A simple test of allowing the food to strike the outer border of the lips first and remembering that anything that will burn the outside of the mouth will burn inside also, whether we are conscious of it or not, should be a tolerably good guide as to the safe temperature at which to take our food.

REDUCED SILVER IN ROOT CANALS.

Excellent results have followed the use of silver nitrate in the cleansing and filling of root-canals, especially those of constricted and tortuous nature. In addition, this material has had extensive application as a preventative of caries, the protection of nearly exposed pulps, the preparation and treatment in root-resection, etc. There may be some disadvantages in its use, however, and these are suggested by Dr. U. G. Rickert in The Journal of National Dental Association, 1919, page 930. One of the outstanding objections to its use is the fact that a decidedly objectionable discoloration may follow its application. Careful manipulation, it is true, may limit this but the possibility is there just the same. Again, it is difficult to keep a stable stock solution. Experience has also shown that in some cases severe irritation may result from its use in root-canals. In spite of these objections, however, much good has resulted since this member was added to the list of useful drugs for dental purposes. To the careless operator who hoped that it would cover up his mistakes, silver nitrate has been a bitter disappointment. Time and clinical experience have demonstrated quite clearly that the same careful preparation must be made for this filling material as for any other. It must not be used as a short-cut or as an incentive to hurried and incomplete root preparation. Dr. Rickert cautions us against becoming over-confident in the sterilizing properties of silver. Serious results are sure to follow if we do this.

A change in the method of preparing the silver solution is suggested. The silver solution used for rapid reduction is made up as follows: "Silver oxide is precipitated from a silver nitrate solution with potassium or sodium hydroxide. This is carefully washed to remove all impurities and kept moist in a small amber-colored bottle. It is possible by this means to keep the solution unaltered for a long time.

In order to ascertain its suitability as a filling material, test a portion of the solution with an excess of ammonia and if it is insoluble prepare a fresh solution. The use of a solution prepared as above is, in the author's opinion, preferable to the ordinarily prepared ammoniacal solution because it is sure to be free from nitric acid and other impurities."

MALOCCLUSION AND PYORRHOEA.

One may safely state that the majority of patients seeking attention of the orthodontist do so because they wish to have certain facial disfigurements corrected. With such a state of affairs we have no quarrel; but what about the thousands of people who have malocclusions of the teeth of such a nature that the facial expression is not very much affected or perhaps not at all? Should these people get orthodontic attention and why? This question may be asked in another way, viz.: what will be the ultimate result if the malocclusion is not corrected? The editor of "The International Journal of Orthodontia" in last month's issue, selects this very problem as one demanding immediate consideration. The opinion of Dr. C. P. Hood of Detroit,—"who is not an orthodontist"—is given because it represents the attitude of a large body of our best thinkers regarding this important subject. Dr. Wood says: "Malocclusion is responsible for more serious troubles with the masticating apparatus than all other causes put together; not the least of these is pyorrhoea. Malocclusion is a great factor in the causation of pyorrhoea."

What will the enthusiasts for extraction say in reply to this striking paragraph from the editorial previously mentioned: "The destruction of the forces of occlusion by the extraction of a tooth which first destroys the proximal contact very soon results in the drifting of the remaining teeth, which eventually brings into play the abnormal forces of the inclined plane. This, of course, produces a traumatic occlusion, which periodontists recognize as a cause of pyorrhoea. However, it necessarily follows that traumatic occlusion is the result of some abnormal force of occlusion, whether it be produced from extraction or the improper correction of malocclusion as has been called to the attention of the profession."

One of the best ways to treat pyorrhoea would seem to be the correction of malocclusion. Or, conversely, the prevention of pyorrhoea is best provided for in the correction of any malocclusion. Some writers have deemed it necessary to place the blame for many dental ills upon the orthodontist, so that it is refreshing to have the other side presented and learn that the orthodontist is really doing good prophylactic work. It is beyond dispute however that much harm may be done through the means of improper appliances poorly adjusted. Unfortunate pathological conditions may easily follow. Proper methods of treatment, however, will result in much good being accomplished.

Dr. Wood does not forget the third molar and wonders why some men have an insane desire to extract every third molar they see regardless of its condition. He explains that in a great many mouths the third molar becomes a useful tooth in that it completes the proximal contact of the arch and acts as a buttress for the second molar. Again, (in the words of the editorial) "We have to recognize that sometimes the third molar becomes a contributing factor to the production of malocclusion, and if allowed to remain in that sense may be said to be a contributing factor to pyorrhoea as malocclusion is one of the greatest factors in the causation of pyorrhoea. Consequently, we find as in a great many cases that no one rule can be applied to all individuals, and in one patient we would advise and insist upon the keeping of the third molar and in another patient we would recommend the extraction. This simply shows that men engaged in the practice of orthodontia or periodontia must have a much broader knowledge of anatomic and pathological conditions than has been possessed by certain individuals in the past." Referring again to the question of the results following extraction; let us quote from a paper by Walter R. Hughes, D.D.S., Oakland, Cal.: "The Contact Point—Its Relation to the General Health,"—in which he refers to the loss of contact by extraction. "What a noticeable inharmonious expression exists when a patient has lost a tooth or teeth. But the patient has suffered more than the immediate loss of the dental organ. If the operator does not insert an artificial substitute to retain the teeth in their proper relations, in a short time there will be loss of contact of the teeth in that locality as well as those in the opposing jaw. The tooth without an opponent is extruded from its alveolus or deflected from its normal position, and as a result the contact either mesially or distally is lost. Whenever there is a loss of contact between two teeth the food crowds into the interproximal space and causes soreness and pain in that locality. . . . . It is plainly to be seen, then, that the loss of contact between two teeth, not only is a great discomfort to the patient, but causes inflammations to stomach or intestinal tract and allied maladies may ensue together with the deeper inflammation of the area around the affected teeth which later may develop into a very stubborn case of pyorrhoea alveolaris."

In the concluding part of his paper Dr. Hughes again emphasizes the importance of maintaining good contact between the teeth which he says "will go a long way toward preventing the occurrence of pyorrhoea alveolaris later in the patient's life." Extraction of the teeth will do much to destroy these contacts and bring about a condition of malocclusion. This thought is deserving of consideration lest we become too hasty in our eagerness to correct immediate ills by means of the forceps.

An Open Letter to the Linotype Man

MY DEAR FRIEND:

Please note that I call you my friend. You are. A good friend chasteneth at times, and you chasten. I have known you to so take the conceit out of me that I have felt like the poorest worm that crawls. You have done this by putting faithfully into type some of the foolish things I have written. At other times you have saved my life—my literary life—by correcting some of the crudities I have put on paper. You have mercifully hidden my blunders from the world, and made it appear as if I could spell better than I really could.

In the same breath I charge you with crucifying me—crucifying me typographically. Many times and oft have you put things into my defenseless mouth that I never uttered—things so inane and senseless that the marvel is that I have not been locked up for safe keeping. It was a genius who coined the phrase "cold type." There is nothing in all chemistry colder than type, and when wielded by a man who has visions it is capable of freezing the heart of a graven image.

You have the advantage of every other individual I know. Your work is done so quietly, so unobtrusively, so insidiously that the world scarcely knows that you exist, and yet you wield an influence second to none in the Empire. If a gross error appears on the printed page the average reader will exclaim, "Well, that writer should never try to break into print till he learns how to write." Or at the best he will say, "That proof-reader surely isn't on to his job."

The reader does not know, as you and I know, that with the modern method of setting type whenever the slightest change is to be made in proof, an entire line must be reset. He does not know—how can he be expected to know?—that in resetting that line the ingenious linotype man has it within his power to incorporate at least two other errors which did not exist in the original line. I have sometimes wailed and gnashed my teeth, and lamented the fact that I did not permit the first error to blush unseen. You know it is, you who are honest—and there are many honest linotype men, else, as I intimated at the beginning, I should not be writing for the public today.

You have no bed of roses—I admit it most freely. You are handed "copy" of all sorts and descriptions--some of it is past description—and you are expected to decipher it infallibly. How you ever manage it is beyond me, and when I think of it I am filled with admiration for your many-sided qualities. I have even gone the length of attributing to you the power of "second sight" when I have seen you make intelligible reading from manuscript which I defy the author himself to decipher.

Not only this but most of your work is done under pressure. The modern rush of things has caught you in its massive maw, and you are subjected to stress from the time the "copy" reaches your hand till it is eaten up by the insatiable press. The marvel is that you make so few mistakes as you do.

After all, you are a wonder. When one considers the fact that every letter of every word of every line on every printed page,—with each little punctuation mark and each space,—requires a separate and distinct thought on your part, and each thought accurate, one can begin to realize the qualities that are requisite to fill the niche in the world that you occupy. When I think of all this I doff my hat, and I forgive you what few faults you have.

And after all, between you and me as fellow craftsmen, do you not think that our common clientele—the discriminating reader—should be a little more charitable than he is of our occasional lapses? If he only knew! From the time the first thought takes form in the mind of the writer till the magazine is laid on the reader's table, there is the constant necessity for hurry. And the makers of magazines do not always feel like hurrying.

For instance, this present article is being written with the writer sitting at his desk wrapped in bath-robes and furs—the first attempt to sit up after an illness. Probably when it reaches the Editor his mind will be so harassed with other responsibilities that he will not be able even to read the manuscript, much less edit it as it requires. Then the linotype man, mayhap his head is well-nigh split with an attack of the miserable influenza. And the proof-reader in all likelihood had to sit up the night before with a sick member of the family; while the pressman may have been nursing an abscessed tooth. And yet the discriminating reader expects the magazine to come out promptly on time and with no errors. If he only knew!

And so I have a hand-shake for my friend the linotype man, for my friend the proof-reader, and for my friend the pressman. Each has an important place to fill, and personally I am under deep obligation to them all. So I believe is the reader if he only knew it.

Sincerely yours,

C. N. Johnson

ORAL HEALTH

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EDITORIAL

The Responsibilities of a Dental Licensing Board

DO the responsibilities of a Dental Licensing Board end when a license to practise has been granted? We doubt whether an intelligent progressive dental practitioner could be found who would make such a claim.

The granting of a license is only evidence that a candidate has reached a certain standard, at a given time. But standards are constantly changing, just as methods of practice frequently change. What was considered good practice yesterday may be malpractice to-morrow. Therefore, licentiates should be required to not only meet a standard, but should also be required to satisfy the Board that they have met at fixed intervals the higher standards of the profession, and have familiarized themselves with approved methods of practice. Every dentist should, in the public interest, keep his methods of practice up-to-date. Why not ask each dentist to take a short post-graduate course, at least once every five years, renewal of license to be contingent upon the successful completion of the course?

Furthermore, a Licensing Board has a public duty to perform in providing for the appointment of a Dental Officer whose duty it would be to visit every dental office in the community periodically, and make a report to the Licensing Board. Every Board, by the very act of awarding a license, assumes responsibility to see that such licensee practises the profession of Dentistry in such a way as not to be a menace to public health and in a manner creditable to the Profession.

The duty of a Licensing Board also extends beyond the mere erection of certain barriers over which each candidate must make a clean jump. A Board's duty is not only to maintain standards, but also to adequately meet the public demand for Dental service, by arranging that sufficient undergraduates be enrolled as students of Dentistry, to meet the dental needs of the community.

The Exchange Situation and Dental Supplies

DENTAL Practitioners throughout Canada are vitally interested in the exchange situation owing to the fact that dental supplies are invoiced to the dentist plus exchange. In most lines of merchandising the exchange is added to the price of the goods, and where this is not done, the exchange, charged as a separate item, is frequently the cause of much irritation and complaint.

Some are apt to argue that goods are frequently sold plus exchange, though these same goods were in stock when the exchange was at par. The merchant, however, is compelled to sell the goods upon the basis of their replacement value, just as a man sells a house upon the basis of what he would have to pay for another, and not upon the basis of what it cost him. This is the only economic principle upon which to proceed.

In the case of gold the government has for some time been shipping available supplies to the United States for the purpose of maintaining international credits. Gold has not been hoarded at Ottawa and the Royal Mint is now required, of necessity, to add exchange to gold bullion because the government is compelled to pay the mines for gold in New York funds. Otherwise the mine owners would sell their product in the United States and thus reap the benefit of the exchange. A part of this increase is being passed on to the individual miners by way of bonuses for the purpose of speeding up production and securing the co-operation of the mine workers in adding to the world's gold supply.

Dental dealers we understand have been averaging the exchange by charging a reduced rate upon the retail price rather than the actual exchange upon the cost price of the goods sold. It is hoped that the whole matter will be readjusted at an early date and an effort is now being made to have the manufacturers share the exchange with the dental dealers and dental practitioners in such a way that it will not be burdensome to any.

The brightest minds in the financial world are studying this exchange question every day and it is hoped before long exchange will come down to its pre-war level. In the meantime nothing can be done to overcome it entirely.

Ontario Dental Society Convention

THE O. D. S. Convention this year will take the form of Progressive Clinics, similar to the very successful convention held last year. This year there will be given a very excellent clinic in Prosthetics by the Hamilton Clinic Club, who will give the Hall Method of Impression Taking and Making Dentures.

The Detroit Clinic Club, Detroit, will clinic on the subject of Crown and Bridge work. The Dental Educational Society, Toronto, will give a progressive clinic on Dr. A. E. Smith's method of Nerve Blocking.

Arrangements are being made for lectures and clinics on Peridontia but details are not complete at time of going to press.

A Mental Epidemic

CITIZENS tainted with Bolshevism should be treated for this "infectious disease" by isolation and restrictions against the spread of the disorder. This disease is doubtless self-limiting, but in the meantime healthy communities must be protected against excesses and impracticable propaganda.

Universal millennium cannot be brought about by any "ism" but right living, right thinking and the proper feeling towards one's fellow man. Let us hope that the result of the war will not only proclaim "Peace on Earth," but "Good Will to Men."

Canadian Dental Association

BOTH the Canadian Dental Association and the National Dental Association chose the last week of August for their 1920 meetings, as announced. The C.D.A. has now decided to meet in Ottawa during the previous week, namely, the 17th, 18th, 19th and 20th August, 1920, so that Canadian Dentists who desire, may attend both conventions.

The National will meet in Boston teh week previous to the Canadian meeting.

Paying Our Debts

"MOST of us would be just a little offended if anyone were to suggest that there was anything of the dead-beat about us, but this matter of paying our debts is, in reality, a bigger and more difficult task than we imagine sometimes. The man that we owe a few dollars to we can pay, though that frequently is hard enough, but when that is done there are a whole host of debts still left upon our hands.

"There has been a great crowd of people, even before we ever came into this world and certainly ever since, who have been doing a great many things for us, and we haven't even begun to pay them back adequately yet. Whether we think of our home, the community, the nation, our profession, or that great thing we call civilization which surrounds and enfolds us all, everywhere we see men and women toiling and sacrificing, much of the fruit of it all drops into our lap unpaid for by us.

"A desire to 'pay back the debt' by way of unselfish service is one of the evidences of true manhood."

DR. R. B. O'SULLIVAN.

Director Dental Services, Department Soldiers' Civil Re-establishment, Ottawa.

DR. O'SULLIVAN is a graduate in Arts of McGill University in Theology of the Montreal Diocesan College, in Dentistry of the University of Pennsylvania, and before going to Alberta, practised Dentistry in Ottawa, having obtained his Matriculation Certificate from the Royal College of Dental Surgeons of Ontario. At the time Provincial Autonomy was granted to Alberta, Dr. O'Sullivan was President of the Alberta Dental Association, and was deputed to draft the Dental Act of the Province.

Landing in France on the 13*th August,* 1916, *with the* 38*th Batt. of Ottawa, he served as Paymaster, Assistant Adjutant, Field Censor, and Postal Officer, returning to England and then to Canada with his Unit for demobilization in June,* 1919.

Dr. O'Sullivan has been busily engaged perfecting the Dental procedure of the S.C.R. and he may rest assured of the united and hearty support of the Dental profession in the effort he is now making that the S.C.R. Dental Service may be made efficient.—Editor.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, MARCH, 1920 No. 3

The Diagnosis and Treatment of Suppuration in the Maxillary Antrum

A Consideration of the Subject from the Standpoint of the Dental Surgeon and the Rhinologist.

PERRY G. GOLDSMITH, C.B.E., M.D.C.M.

Associate Professor of Oto-Laryngology, the University of Toronto.
Senior Assistant Surgeon, Oto-Laryngological Department, Toronto General Hospital.

ACUTE and chronic inflammation of the lining membrane of Highmore's antrum is one of the most frequent causes of nasal complaints since it is almost always associated with those inflammatory phenomena which we know as coryza or cold in the head. Hence it is not uncommon also in influenza, pneumonia, measles, scarlet fever, and may even result from nasal sepsis following intra-nasal operations or injudicious packing. Practically all coryzas associated with purulent nasal discharge indicate probable involvement of a nasal accessory sinus. The antrum of Highmore is the one we most commonly meet, with since nature takes care of the other sinuses much better.

The frequency of antral suppuration is well seen in an investigation of one hundred post-mortem cases by Joseph P. Tunis (1) who found thirty-seven cases of empyema of the antrum of which 10 per cent. were undiagnosed during life.

This is not difficult to understand, in fact is to be expected when one considers the anatomy of the outer wall of the nose. The nasal mucous membrane is, generally speaking, lined with ciliated epithelium, which is continued into the maxillary antrum through the natural ostium in the unciform groove or an accessory opening which is present in about twenty-five per cent. of cases.

Furthermore the close relationship existing between it and the molar and the bicuspid teeth renders dental infection easy since a layer of mucous membrane only may exist between them. Dental caries, root infection, is directly the excitant of antral suppuration in thirty-three per cent. of cases (2). This percentage would now, I think, be considered too high, as it cannot exclude infection from the nose as well. Occasionally I have been able to feel a projecting fang in the floor of a chronic antrum when performing a radical operation, but in which no evidence of any dental inflammation existed.

An explanation of this may be found in the remarks of Mr. Norman Bennet in discussing Mr. Herbert Tilley's paper on Antral Suppuration at the Odontological Society of Great Britain, 1903. He says: "When the periosteum of the apex becomes thickened and granulation tissue is formed near the apex of the root there is a great tendency for absorption in that direction and thus open into the antral cavity. Furthermore it should be remembered that organisms can pass through comparatively healthy tissue without affecting them but produce serious results in neighboring lymphatic glands—example, acute tonsillitis and enlargement with or without suppuration in the cervical lymphatic glands. It is quite conceivable then that an infected crown may have a direct bearing on an antral infection and a pyorrhoea an even more direct connexion. The attempt to associate antral disease with the history of any probable tooth is liable to be fallacious since a slight nasal catarrh may be the first evidence of the sinus disease. Again the antral disease in favorably placed roots may cause root infection.

Cryer quoted by Joseph P. Tunis (3) has seen over 50 cases in which unerupted or impacted teeth of the upper jaw caused inflammatory conditions of the bone and mucous membrane of the maxillary antrum.

Briefly, then, there are two causes of infection: (1) Nasal, the most common, and (2) dental. The former may take the role of a simple acute rhinitis, local or associated with some other acute disease in which rhinitis is a frequent association. The latter may be associated with acute or chronic root inflammation or follow difficult or unskilled root extraction.

One's conception of the relationship of accessory sinus suppuration to both nasal discharge and some pains in the head is greatly enhanced by looking on the nose as the common duct or outlet of a number of cavities often separately diseased and a diagnosis of independent disease of the mucous membrane of this common duct is never justified until the smallest of these accessory cavities has been with certainty excluded. (Grunwald).

ANATOMY.

This hollow space inside the cheek bone varies greatly in size. It may be a mere chink or hold as much as an ounce of fluid. It is pyramidal in shape, with the base toward the nose and its apex to the outer part of the superior maxilla. Above it forms the floor of the orbit, and in it is found the infraorbital nerve, while below it forms the upper boundary of the roots of some of the teeeth in the upper jaw, particularly the molars and second bicuspid. Posteriorly it forms the

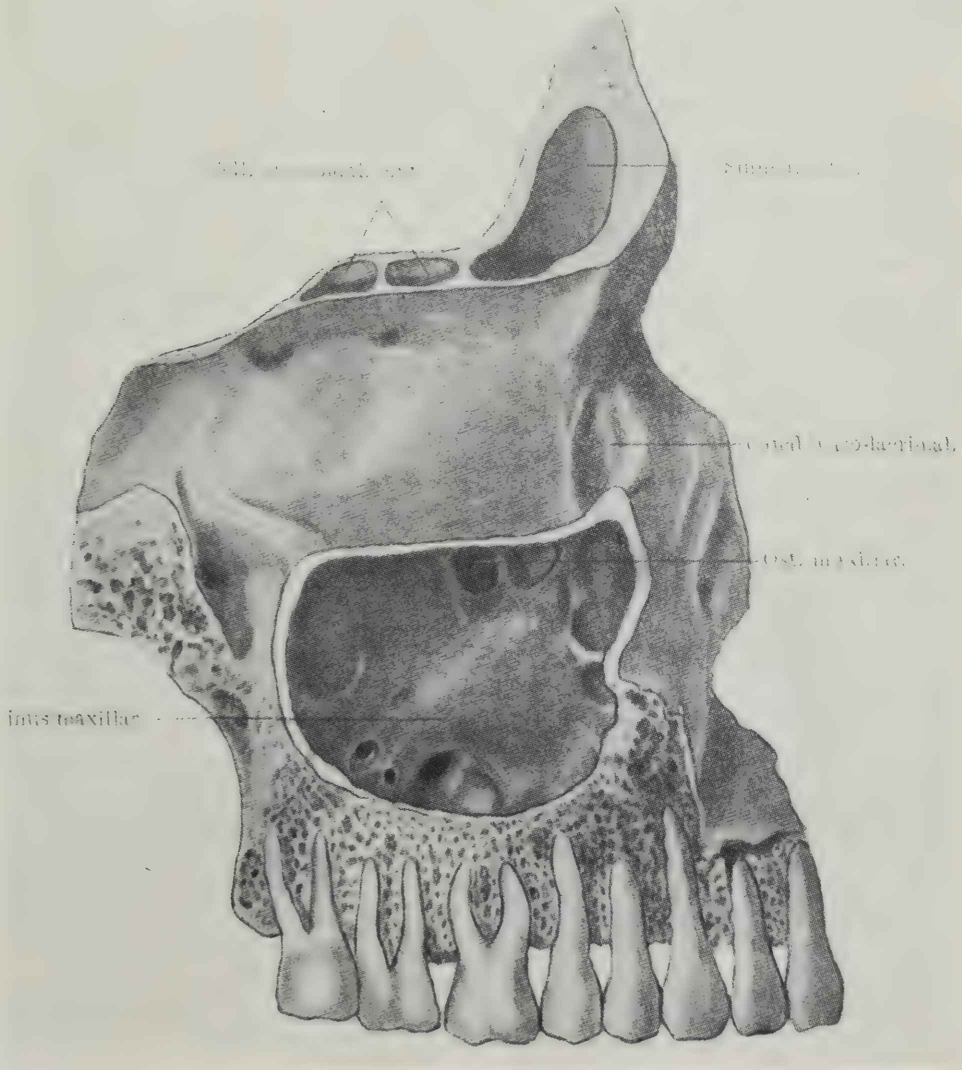

Plate I.

Dissection showing the right maxillary sinus opened upon its outer aspect. The ostium maxillare is seen situated immediately below the roof of the cavity. The outer table of bone is removed in order to show the relation of the fangs of the teeth to the floor of the antrum. Anterior ethmoidal cells are seen passing into the roof of the orbit behind the frontal sinus.
—Logan Turner.

anterior boundary of the pterygoid fossa, while in front it is mostly in relation with the canine fossa in which situation the bone may be very thin. The base, which is the most important boundary, corresponds to the outer wall of the middle and inferior nasal meatuses. This wall is divided into two portions by the attachment of the inferior turbinate bone, the superior portion corresponding to the outer wall of the middle meatus and having in its upper and back part an opening, the natural ostium, while the lower part is in relation to the outer wall of the inferior meatus and is marked by a slight ridge showing the situation of the lower end of the lacrymo-nasal duct. The upper portion is thin and composed of both bone and membrane, but the lower part is made up of bone of varying thickness, but thinnest immediately below the point where the turbinal flange ends.

From this it will be noted that we have a secreting membrane in a large cavity, the floor of which is generally lower than the floor of the nose, and which has its natural ostium near the roof. It is not surprising, then, that once infection takes place in the antrum there is little chance of its terminating without the formation of considerable exudation.

A further study of the region of the natural ostium from the nasal side aids us in comprehending how easily the intricate drainage system may be completely disorganized. The unciform groove may no longer resemble a gutter, if in the presence of a chronically inflamed nasal mucous membrane there is also a prominent bulla and an hypertrophied lip of the uncinate process. If to this is added an enlargement of the anterior portion of the middle turbinate the unciform groove may resemble a tube or somewhat a blind sac.

In his studies in the anatomical department of Harvard Medical School, Harris P. Mosher found that in fifty per cent. of his specimens he could pass a probe from the frontal sinus directly into the maxillary antrum by way of the fronto-nasal duct. This explains how the antrum may act as a reservoir for pus secreted elsewhere, or if diseased in association with other sinuses (frontal and ethmoidal) may fail to respond to treatment because it is continually re-infected from above. Failure to recognize this accounts for practically all the so-called incurable cases, excluding, of course, those in which syphilis, cancer or foreign body have a part.

PATHOLOGY.

J. S. Fraser (4), of Edinburgh, writes very thoroughly on the changes that take place in the antral mucosa. He shows that these changes are analogous to those that take place in the nose in catarrhal and suppurative rhinitis, and in the middle ear cleft in catarrhal and suppurative otitis media. Quoting Oppekofer, he points out that the changes in the mucosa are not uniform, but vary in different parts, and ulceration with bony necrosis almost never exists. In an examination of the mucous membrane in nineteen cases of acute and chronic sinusitis, Fraser found only one acute specimen, and that in a sphenoidal sinus, obtained at autopsy on a case of pneumonia. In this instance the mucosa was thickened, deep red in color with a velvety surface. The sinus contained thick muco-pus, but no blood. Microscopically the prominent feature was the extensive hemorrhage in the sub-mucous tissue and the engorgement of the blood vessels. The superficial epithelium was in places markedly degenerated.

In the cases of chronic inflammation it was noted that the superficial layer might be apparently normal, although there were marked changes in the submucous tissue. The number of "ghost" cells in the superficial layer is often large. Hajek has shown that in the nasal mucous membrane these cells are associated with a discharge of mucous and thinks it is almost certain that the same obtains in the accessory sinus.

In most of Fraser's specimens leucocytes were seen making their way between the epithelial cells to the surface, there to mix with the mucous secretion and form the muco-purulent or purulent exudation characteristic of sinus catarrh or suppuration.

MICRO-ORGANISMS.

In the chronic cases no organisms were found in the tissues of any case, but only from the surface discharge. Lack is quoted as expressing the view that there is no definite evidence at present to show that a particular organism or mixture of organisms is associated with any definite sort or degree of antral inflammation.

SYMPTOMS OF ACUTE MAXILLARY SINUSITIS.

These are so generally associated with the acute manifestations of the associated and causative coryza, that for the moment the sinus infection is masked. The malaise, nasal obstruction, headache and pain over the front and side of the head, which accompanies all coryzas, is often associated with two definite symptoms pointing to involvement of the maxillary antrum, viz., pain in the cheek increased on leaning forward and tenderness in the canine fossa. When this is associated with a purulent discharge from the corresponding nostril, the diagnosis becomes more positive. The position of the pus in the nose is very important since it is in the middle meatus between the anterior end of the middle turbinate and the outer wall of the nose that pus from the antrum is first seen. True, it may come in this situation from the anterior ethmoidal cells or the frontal sinus. If, however, the pus is wiped away and the patient's head tilted forward and to the opposite side, a rapid reappearance of the discharge is strongly presumptive of a collection of secretion in a cavity, the opening of which is higher than its floor, that is the maxillary antrum.

The pain usually present only in acute cases of antral empyema may be quite outside the antral area. Having regard to the fact that the 5th nerve through the spheno-palatine ganglion and its connections with other ganglia supplies the interior of nose, the accessory sinuses even the tentorium, scalp, forehead, jaws, teeth, palate, tonsils and ears, referred pain may take place in remote areas. It is often noted that pain above the eyes in the lower part of the forehead is as often due to antral as to frontal sinus suppuration.

Additional diagnostic aids are suction and transillumination. The value of the former is lessened owing to the ethmoid and frontal being also acted upon, while the latter may be deceptive, owing to a thickened bone, a thickened membrane from former chronic inflammation or the presence of a large cyst in which the diseased side may transmit the light much more than the healthy side.

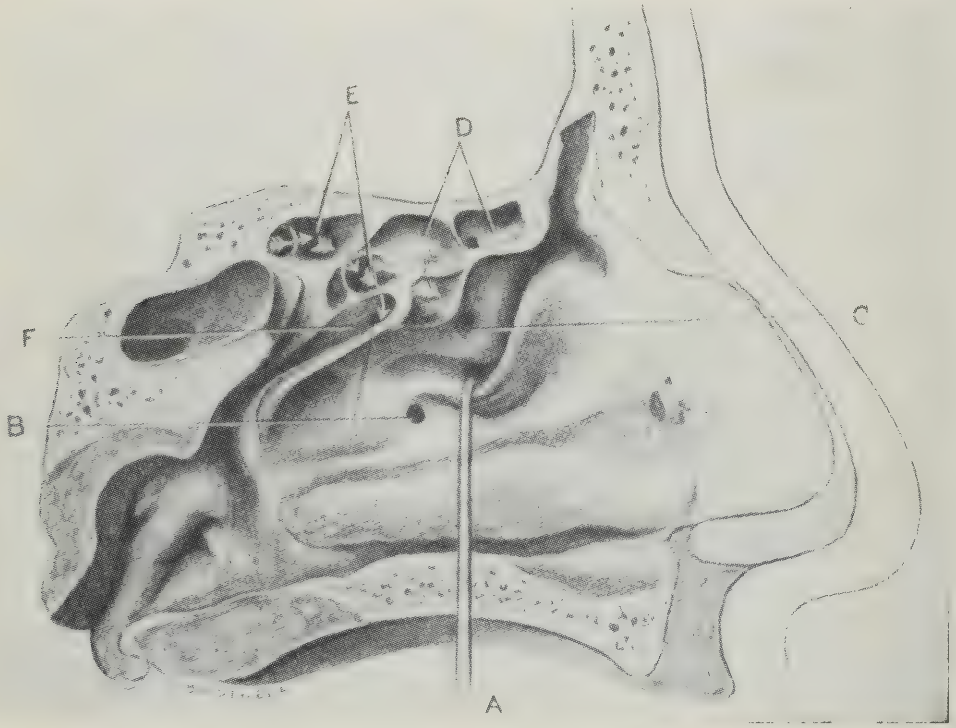

Plate II.

A. Hook drawing down the inner lip of the hiatus semilunaris, so that the opening into the maxillary antrum can be seen.
B. Accessory opening into antrum.
C. Opening of ethmoidal into middle meatus.
E. D. Superior ethmoidal cells opening into—
F. The superior meatus.

—Herbert Tilley.

One must not forget to remove a dental plate or any nasal packing before transilluminating. This is a diagnostic aid, very frequently reliable in acute cases, but it is the experience of all rhinologists that pus is not infrequently found when transillumination points to its absence.

The X-ray is seldom required for acute cases, and is of very limited value. In acute inflammation of chronic empyema or chronic cases the skiagraph is of much more value, and especially so to show the position and condition of the tooth roots. Not only can one gain knowledge of the presence of septa and size of the antrum, but he can at the same time gain evidence of the presence or otherwise of disease in the ethmoid, frontal and sphenoid. The rare cases in which a foreign body is present in the antrum are, of course, spotted at once.

PROOF PUNCTURE.

It is only by irrigation of a sinus that the presence or otherwise of secretion can be *positively* affirmed. This is made by a fine trocar and cannula passed through the naso-antral wall and followed by a watery solution, the return flow being caught in a black basin. Pus, mucus and epithelioid debris show up much better on a black background.

The puncture may be either in the inferior meatus, close to the flange of the turbinate where it turns downward and where the bony wall is thin or in the middle meatus. If the latter route is chosen, Watson Williams' syringe and cannula form a rapid and excellent way of determining the contents of a maxillary sinus. Failure to get a return flow from the sinus may be due to (1) not having gone far enough back in the nose and hence being in the cheek in front of the sinus, (2) the tip may be in a mass of polypoid tissue or imbedded in a thickened membrane on the opposite wall; (3) the cavity being filled with polypi or new growth mechanically obstructing the ostium from within; (4) extreme swelling of mucous membrane of the unciform groove with the presence of a large cystic middle turbinate. Withdrawing the cannula a short distance and again trying to syringe through may be successful.

When there is a sinus or a prominence above the teeth in the region of the canine fossa the possibility of this being due to a dentigerous cyst must be considered. Antral empyema alone never produces any bulging of the bone but malignant disease of the upper jaw frequently does. When, therefore, there is suppuration in the antrum with a bulging of its wall either into the hard palate, orbit, anterior wall, or nose, the association of malignancy must be remembered.

TREATMENT OF ACUTE CASES.

If there are any diseased roots of the teeth in relation to the floor of a suppurating antrum, they should receive appropriate dental attention. If the teeth are extracted, and even though they extend into the antrum, alveolar drainage is practically no longer practised or recommended.

I am not unmindful that it is the experience of many dental surgeons to find the removal of a septic root, whether projecting into the antrum or not, has frequently been followed by a rapid subsidence of all inflammatory reaction in the sinus. In not a few cases this has been associated with a free discharge from the corresponding nostril. If, however, the acute inflammatory phenomena are followed by a nasal catarrh on the same side one should be strongly suspicious that the antral mucosa had not regained its normal condition. Furthermore, it is not wise to assert too confidently that alveolar drainage alone has *cured* the sinus suppuration since the alveolar opening may close and a quiescent antral inflammation or catarrhal condition follow which is periodically "lit up" as it were by an acute coryza. In such cases increased secretion follows overflowing into the nose and the antral disease is then called nasal catarrh.

The patient is better in bed and appropriate measures taken, directed to controlling the acute nasal catarrh, such as calomel and salines, liquid diet and diaphoresis. Our most important objective is ventilation and drainage of the cavity, and to this end the cleft between the middle turbinate and the outer nasal wall is packed with wool or gauze saturated with a five or ten per cent. solution of cocaine, to which is added a little adrenalin. This aids greatly, not only in relieving the discomfort by removing pressure, but assists very materially in rendering the ostium patent. Hot saline douches in the nose, or as Lack says, scarifying the anterior end of the middle turbinate, tend to lessen the turgescence in the unciform groove. Posture may aid us very much. Waggett (5) speaks very highly of the method by which a patient lies down in such a position that the ostium comes to be the lowest point of the antrum. He must lie with his head almost inverted, the superior parietal region of the sound side resting upon the mattress, while the shoulders are raised upon pillows. Hours, he says, may profitably be spent in this attitude. The use of a suction pump has many warm advocates. Inhalations of benzoin or pine in hot water or an alcoholic mixture of menthol in the same manner aid in lessening the nasal congestion.

If rapid improvement does not follow these simple measures it is better to irrigate the sinus through an artificial opening. The natural ostium is now seldom used. The cavity may be syringed out in the same way as described in making a proof puncture for diagnostic purposes. It is not necessary to remove any portion of either turbinate to pass the trocar. My own practice has been to use a fine Lichtwitz trocar and cannula, which, after cocainizing the outer wall of the inferior meatus, is passed through the antro-nasal wall directly below the attachment of the inferior turbinate bone. More familiarity with the various instruments used in sinus exploration, together with a personal visit to Dr. Watson Williams, of Bristol, England, where the excellence and rapidity of his methods have my heartiest admiration, leads me to employ his suction syringe much oftener. Lavage of the antrum is, in the vast majority of cases, easily and rapidly carried out, and is not particularly painful. One must remember, however, that in acute cases or in cases where an acute exacerbation of an old condition exists, this simple procedure may not only cause very severe and long-continued pain, but also profound shock. A sharp trocar, great patience and gentleness are essential. Very gentle syringing at first may avoid great distress. If the case be an acute one grafted upon a chronic empyema the viscidity of the secretion may cause considerable delay and difficulty for the return flow to appear in the nose.

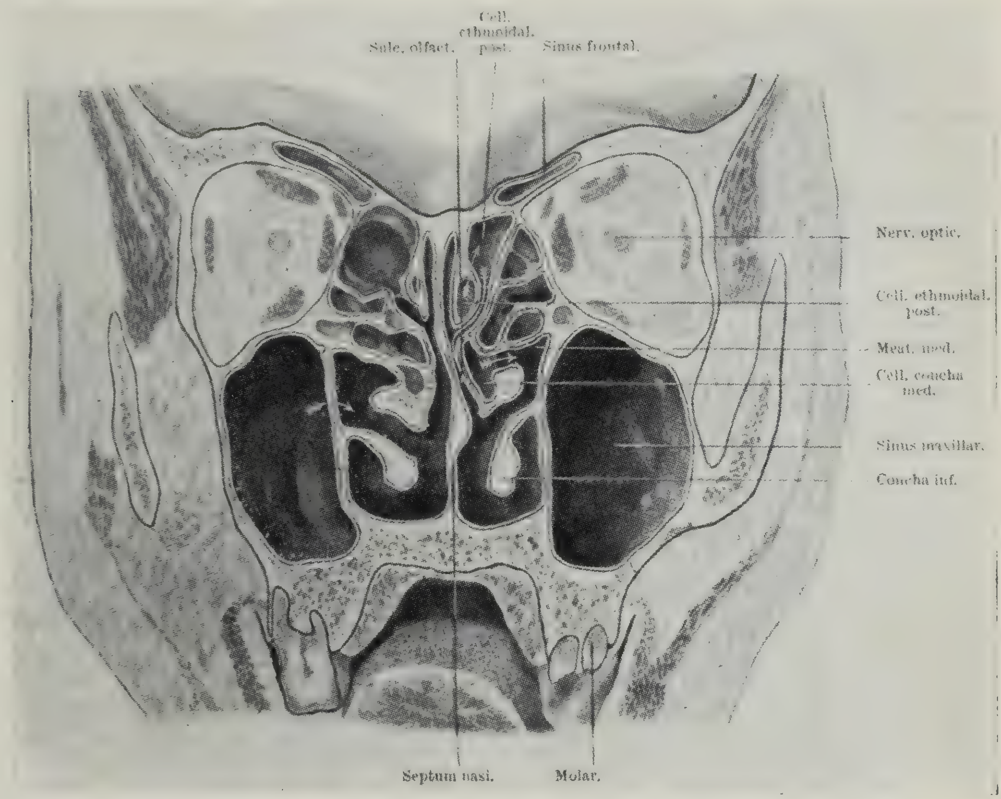

Plate III.

Drawing from a frozen section, kindly lent to the author by Prof. Symington. The vertical coronal section through both nasal chambers and maxillary antra is made on the plane of the first molar teeth, and is viewed from in front. On the right side an arrow indicates the position of an accessory maxillary ostium. On the left side the posterior ethmoidal cells are seen opening into the olfactory cleft and a middle turbinate cell into the middle meatus. The section also shows the frontal sinuses extending for a considerable distance backwards along the roof of the orbit.—Logan Turner.

In acute cases the discharge may appear at first as a reddish brown secretion, but all variations to pure yellow pus may occur. Occasionally the odour is very foul, and this suggests a dental origin, even though no clinical evidence is present. Patients frequently complain of pain of a pressure type in apparently healthy molars or bicuspids while the autrum is being syringed.

As soon as the effect of the syringing has worn off, and this may take an hour or more, the patient is greatly relieved, his nasal inflammation considerably reduced, and his sense of well being greatly improved. The dependent posture may then be sufficient to permit of adequate drainage and resolution follows in a short time. It may be that repeated irrigations will be required, and it is then one's nicety of touch and direction that permits his entering the same hole every time. I am satisfied that it is not the chemical formula of the solution used, nor the mechanical removal of the products of the inflammation that brings about the great relief and rapid cure. Ventilation takes a much more important place in the treatment and does not receive the credit it deserves.

The pain in acute antral cases may be greatly lessened by the use of a hot compress or hot water bag to the face, but it is necessary occasionally to administer aspirin, phenacetine or even morphia. Wrapping the head and face in a hot flannel shawl often gives great comfort. If blowing the nose frequently and forcibly does not cause any marked discomfort it should be encouraged.

The difficulty in securing intra-nasal ventilation and drainage may be associated with various degrees of nasal obstruction, such as enlargement of the anterior end of the middle turbinate, marked hypertrophy of the covering of the inferior turbinate, or the presence of a large bulla ethmoidalis, with or without hypertrophy of the membrane covering the anterior lip of the unciform groove. High deflections of the nasal septum with the convexity toward the affected antrum are frequently found. After the acute infection has subsided appropriate treatment for the nasal obstruction may be required either to prevent a chronic inflammation taking place or a recurrence with each subsequent acute nasal catarrh.

How long one should persist in irrigating an acute suppurating sinus is difficult to say. It must be remembered that too energetic treatment is unwise, too frequent irrigations may tend to keep up the discharge, and the use of strong disinfectants is not generally advised.

Not infrequently, when we have almost concluded that some form of permanent drainage is advisable, we are agreeably surprised to see how rapidly the case recovers after all treatment has ceased. Change of air, a trip to a warmer climate, or to the seaside often leads to a rapid clearing up of all discomfort and discharge.

It may be stated that if, after all acute manifestations in the nose have ceased and *there are no evidences of any other sinus on the same side being involved* and the return flow is still markedly muco-purulent, some form of counter-drainage will be required.

One should, I think, take into consideration the age, occupation, social and physical condition of the patient, also the presence and degree of pain or neuralgia and the association of any systemic disturbance due to absorption or swallowing of pus. This has been thoroughly discussed by Ross Skillern (6) in determining when to operate on the chronic cases. Furthermore, it is well to remember Sir Felix Semon's advice, "A person may go through life, yea, even enjoy life, with a suppurating maxillary antrum."

Bruck (7) further emphasizes the point when he insists on the responsibility we assume when advising nasal operations, when we must know that patients suffering from chronic nasal disease are often neurasthenics or hypochondriacs and readily resign themselves to the small inconveniences of their sufferings or discomforts, if you assure them that they have not any dangerous disease or that there is no disposition to tubercle, cancer, etc.

When one has taken into consideration all these points, and it is still considered wise to employ further operative measures, a resection of the antro-nasal wall in the inferior meatus should be the operation of choice. This will be further discussed in dealing with the treatment of the chronic form.

CHRONIC SUPPURATION SYMPTOMS.

A sinus with a history of long continued suppuration may have an acute infection grafted on its chronic state. This usually takes place during an acute rhinitis. The symptoms while not so severe so far as pain and discomfort in the antrum are concerned, are generally associated with a greater and more offensive discharge from the nose.

Lavage alone may result in cure in a few cases, but the duration of this method of treatment is likely to be very trying both to the patient and surgeon. The use of disinfectants does not appear to act further than to lessen the odour.

The diagnostic methods mentioned in acute cases all apply to the investigation of a chronic empyema but with an added significance in the case of transillumination and the X-rays. The latter gives information as to the presence of septa and partial partitions. The presence of a large cyst may make the *healthy* antrum appear the more cloudy on the plate.

As in acute cases the only diagnostic method of any real value is exploratory puncture. One must not too readily decide that the antrum is clear because the first part of the fluid returns clear. This is shown very forcibly in a case I recently saw in which all the clinical signs of a chronic empyema existed, yet it was only after a pint of fluid had passed through the antrum that evidence of extensive disease was elicited. At the radical operation in this case the antrum was found nearly full of a caseous material which could be lifted out with a scoop, and in appearance and consistence resembled very much the ordinary cholesteatoma found in the mastoid and middle ear in chronic middle ear suppuration. Prior to irrigating any sinus it is wise to see that all secretion is removed from the nasal cavity so as to be sure that whatever secretion comes away has been secreted by the cavity under examination.

TREATMENT OF CHRONIC SUPPURATION.

The guiding principles of treatment should be:

(1) Permanent ventilation and drainage.

(2) Removal of polypoid mucous membrane in the antrum.

(3) Prevention of reinfection from any associated sinus disease.

It has been advised by Skillern that before attempting any surgical measures, the effect of gradually increasing injections of alcohol or silver nitrate should be tried. My own experience with chronic cases does not lead me to view any form of local treatment with favour. I attach much greater importance to dental attention where removal of diseased or septic roots may very materially aid a regeneration of the antral mucosa after the radical operation has been carried out. As in acute cases, I do not favor alveolar methods of treatment or so-called drainage. Grunwald (8) many years ago, said, "I would especially emphasize the fact that a tooth must not be considered harmless because the socket is not diseased. Infection creeps along the lymphatics of healthy bone and a focus of infection in the crown of a tooth is to be by no means despised, for even if an empyema of the antrum is due to another cause, yet disease of the crown of a tooth is calculated to maintain such a state of irritation in the mucous membrane as may frustrate all attempts at cure."

Children are not very common among our antral cases, probably because the smallness of the cavity assists a rapid cure. When present as a chronic disease intra-nasal measures without general anaesthesia being usually impossible, some sort of radical operation, the simpler the better, will be required. The frequency with which the ethmoidal labyrinth is involved in the young suggests attention to this area and thorough drainage here is often followed by cure of the antrum without any other treatment. Mosher has pointed out that the ethmoidal labyrinth often overhangs the antrum at its inner and posterior corner, while it is not at all uncommon to find ethmoidal cells extending along the floor of the orbit in the roof of the antrum.

The general condition of the patient should always be considered before any operation is undertaken. Chronic nephritis and diabetes are indications which should cause careful consideration as to the advisability of any serious operative procedure. The aged, whose recuperative powers are not good and in whom shock is a serious condition, should be subjected to as little surgical interference as possible.

INTRA-NASAL OPERATION.

The removal of a portion of the inferior turbinate bone is nearly always essential to securing a permanent opening in the external wall of the inferior meatus. The anterior end is usually removed with scissors and snare. Some operators regard the anterior end of such physiological importance that the middle portion is removed. This for me makes the operation more difficult, and I have not yet regretted having removed the anterior portion. The operation is performed under local anaesthesia. A weak solution of cocaine, say five per cent., is applied to both sides of the inferior turbinate, and after waiting for twenty minutes or half an hour a stronger solution is brushed along the antro-nasal wall. It is better to use weak solutions with adrenalin and wait longer than secure a rapid anaesthesia with the danger of toxic symptoms from cocaine.

After the turbinate portion is removed the dividing wall is rapidly taken away, using various chisels or burs, according to the operator's fancy and experience. The opening may be enlarged both anteriorly and posteriorly with cutting forceps, of which Ostrom's is a satisfactory type. In thin walls this is rapidly and easily performed, but where the bone is dense and thick difficulty may be experienced in securing an opening which is sufficiently large to be permanent. There is a great tendency for this opening to close, hence a large one is very desirable. Packing the nose and antrum is undesirable, but the subsequent bleeding from the stump of the turbinate, frequently necessitates gentle nasal packing with gauze impregnated with some bismuth or other ointment, to facilitate removal, which should take place not

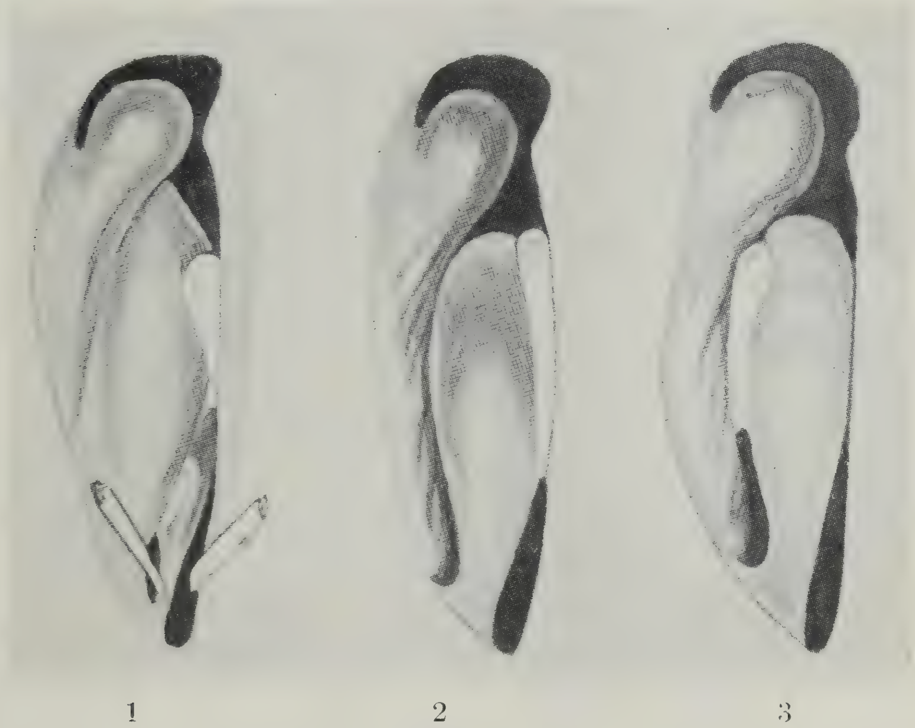

Plate IV.

(1) Pus from under the middle turbinate, indicating empyema of the frontal sinus, anterior ethmoidal cells, or maxillary antrum.
(2) Pus from above the middle turbinate, indicating empyema of the sphenoidal sinus or posterior ethmoidal cells.
(3) Much enlarged unciform cushion, simulating the middle turbinate. Exposure of the true middle turbinate by the use of retractors.—Waggett.

later than twelve or twenty-four hours. It is best to leave the nose alone then for a few days, when intra-nasal irrigations may again be practised. The patient can easily be instructed how to pass a well curved Eustachian catheter into his antrum and irrigate it daily. When the opening is large any good douche directed to the outer wall of the nose low down will probably do as well. If intra-nasal measures are to be sufficient to cure the patient, he has the cure in his own hands. Varying the solution from time to time is helpful, while the use of weak zinc salts is especially so when the discharge becomes mainly mucous or consists of a small mucoid mass or blob. Prolonged douching seems to keep up the mucous discharge in some cases, and if the nose is then left alone for a week or two one often finds no further necessity for any treatment. This form of treatment will be sufficient for a considerable number of cases, probably in those where chronicity with marked changes in the antral mucosa has not been long established. Even if it fails, one has the satisfaction of knowing that a part of the radical operation has already been carried out.

Operation Through the Canine Fossa.

The advantage of an operation that permits direct inspection of the diseased area is obvious to all surgeons. As the canine fossa enters so largely into the formation of the anterior wall of the antrum, opening through this area fulfils all our requirements. "The original operation of Desault and Kuster consisted in opening the canine fossa and carrying out all subsequent treatment through this aperture. Unsatisfactory results followed, principally because the disease was not always cured and was frequently followed by a buccal fistula. Scanes Spicer modified the procedure by adding to it intra-nasal drainage as described above under intra-nasal operations. Subsequently the names of Caldwell and Luc became associated with this modification and the operation is now known as the Caldwell-Luc operation." (9).

Various other procedures have been advocated, each having the common aim of securing direct inspection of the antral cavity. The Denker operation is probably the best known and aims to do away with the angle formed by the anterior extremity of the outer nasal wall in the inferior meatus and the corresponding front wall of the superior maxilla.

The writer favors the Caldwell-Luc operation, and it alone will be considered. This operation reaches the antrum by reflecting the mucous membrane and periosteum from the canine fossa, the upper lip being well retracted to permit of easy access.

I always use general anaesthesia for these cases, but it is not absolutely essential. Recently in Edinburgh, I saw Logan Turner open an antrum in the canine fossa under cocaine anaesthesia. The tissues over the canine fossa were injected with cocaine and adrenalin solution, while into the antrum was injected a drachm or more of a 5 p.c. solution of cocaine. Dr. Turner tells me he has not had any toxic effects from so doing, probably owing to the feeble absorbing powers of the antral mucosa. Razemon (10) is a strong advocate of local anaesthesia in antral cases. W. S. Syme (11) (Glasgow), in an analysis of 878 cases of antral disease seen during the last five years, operated by the canine fossa route in 396, and of these 306 were performed under local anaesthesia.

The bleeding is easily controlled by pressure and any excess is caught in a gauze pad placed in that side of the mouth. With care one may remove sufficient bone without disturbing the lining of the cavity. This is desirable since it permits of a large portion of the diseased lining being removed by simply separating it from the antral walls with a curved thin separator. When any membrane is removed from the antrum bleeding rapidly obscures the field and considerable time will be saved if the cavity is packed for five minutes. While waiting the time may be profitably spent in enlarging the cavity with bone forceps and removing any corners or spiculae present. The opening should reach the level of the antral floor and sufficiently well forward to secure a clear view of the antro-nasal wall.

Sufficient time having elapsed to presume a clear field the packing is removed and a thorough inspection of the cavity made. I always palpate the cavity thoroughly and secure valuable information as to the depths of the recesses and the thickness of the diseased membrane.

Septa forming pockets and all polypoid tissue are now thoroughly removed, taking care not to injure the infraorbital nerve in the roof. One must not try to remove all the mucous membrane, as this results in the excessive formation of granulation tissue, rather he should be sure to leave fairly large islands of mucosa from which subsequent growth can extend. I have found wiping vigorously the cavity with gauze of value, and I suggest the use of a burr covered with layers of gauze or similar material which could be made to revolve rapidly and thoroughly clear out all the angles. In cases where there is not a marked change in the mucosa it is questionable if any curettage is desirable.

When one has satisfied oneself that all the nooks and corners of the cavity have been carefully cleared one is then ready to remove the antro-nasal wall. This is best achieved by the use of a flat chisel and mallet, taking care not to pierce the nasal mucosa. By avoiding this bothersome haemorrhage is avoided and a more thorough and systematic removal of the bony wall is accomplished. This membranous wall is then removed with a narrow knife or it may be turned down over the cut edge of the bony wall and lie in the floor of the antrum. This is advised by Boenninghaus, and I have found it an added refinement to the operative technique.

If there is associated with the antral disease a similar condition in the ethmoidal region with the formation of nasal polypi this area should receive appropriate attention. Considerable attention has probably been bestowed on this region under local anaesthesia on a prior occasion and little may now be required. It is frequently very easy to secure satisfactory ethmoidal drainage by attacking the ethmoid through the upper and inner antro-nasal wall. Mosher's method (12) is the one I usually employ. The anterior end of the inferior turbinate, if not already removed, is now taken away.

There is some difference of opinion as to the advisability of packing the nose and antrum after this operation. The ethmoidal region should never be packed since meningitis has been known to follow. There does not seem to be any valid objection to a strip of gauze being placed through the antro-nasal opening and against the turbinate as it lessens the liability to prolonged oozing of blood and is very easily removed the following day. I am not in the habit now of suturing the buccal wound. Formerly I did so, but I have seen no advantage follow.

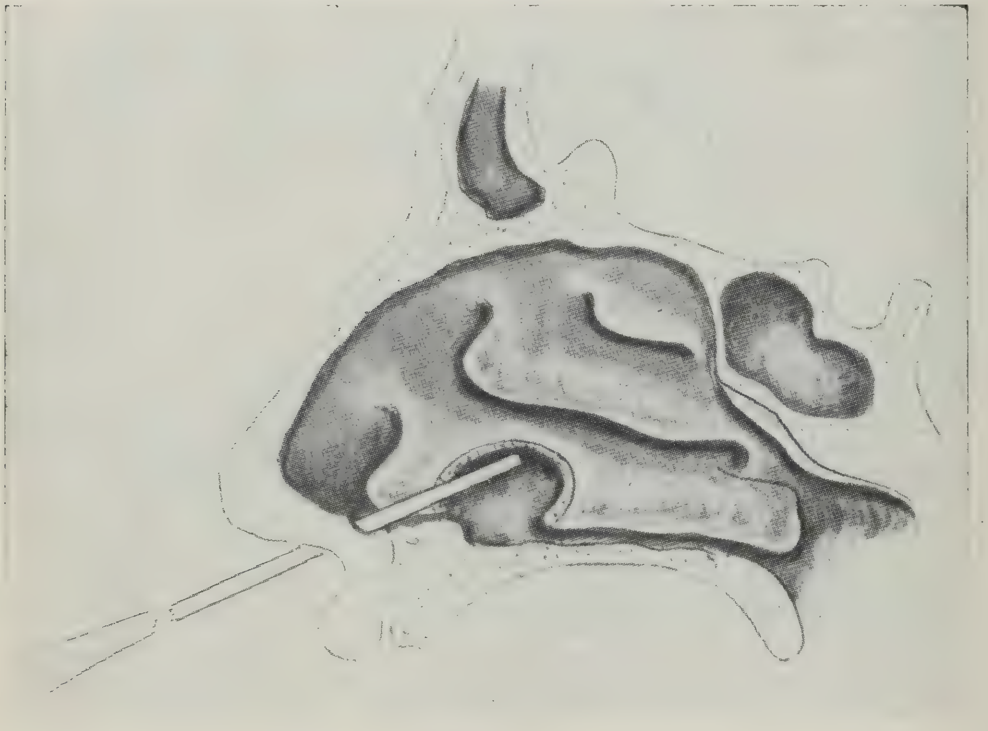

Plate V.

Shows the method of introducing a Lichtwitz trocar and cannula into the antrum through the inferior meatus.

In order to show the proper point of entry through the antro-meatal wall, a part of the inferior turbinate body has been removed, but no part of the turbinate body is cut or removed in practice.—P. Watson Williams.

Pain in the face is not unusual for the first twelve hours, depending, I think, very much on how roughly the cheek has been retracted.

I usually order a small dose of morphia to ensure a quiet night. All packing is removed the next day and no more inserted. It is a good rule to leave the nose alone for a few days. The patient should not blow the nose, rather he should draw the secretion back and expectorate it.

Softening the nasal vestibule with oil or vaseline adds to the patient's comfort, while the use of a hot water bag relieves the feeling of tension and pain in the cheek. Cold is preferred by some, but heat has been found in my cases more agreeable.

On the third or fourth day the patient may be encouraged to blow the nose gently, taking care to support the cheek with the hand so as not to blow open the buccal wound. Gentle irrigations with warm saline or boracic solution may now be commenced, using at least a pint each time.

The reaction following the operation varies in different people. Some have to remain in bed as long as two weeks while others are up in a few days. Feeble and neurotic women or those past middle age often suffer considerable shock.

In cases complicated with ethmoidal disease it is generally necessary to remove hanging tags and small bony spiculae after the first week or so. We should deal very gently with this area.

The patient is now ready to be shown how to irrigate his own antrum and may do so without any other treatment for the next few weeks, when he will be practically well, especially if the antrum alone is involved. An oil spray is grateful to the patient in that it tends to keep soft the dry crusts which form during the healing process.

COMPLICATIONS.

It is seldom one meets with any unusual reaction following radical antrum operations. Shock, meningitis, and septic infection have occurred. The first two are treated on general surgical principles, while the third is rapidly controlled by frequent nasal irrigations with mild alkaline solutions.

The altered condition of the antral mucous membrane, together with the drying effects of a greatly increased air circulation in a cavity nature never intended to be so exposed must result in occasional collections of mucoid secretion. This may also occur during any subsequent head cold, but the presence of good drainage makes for little or no discomfort and whatever inconvenience ensues is rapidly relieved by the patient irrigating once or twice the antral cavity.

The consideration I have given to antral disease is as one finds it in civil life. So far as sinus cases are concerned the war has produced them in large numbers. Many cases have been seen in which the bullet passed across the face through both antra and required no treatment whatever. The presence of shell splinters or foreign bodies of any sort require as a rule permanent intra-nasal drainage. Many cases are complicated by the associated comminuted fracture of the superior maxilla where small necrotic bits may keep up the antral discharge until they are detached. Lavage does not seem to be as good in these traumatic cases, probably because, as J. F. O'Malley (13) says, "the procedure destroys the epithelial protective cells, and in case of an open granulating wound, the newly formed granulation tissues absorb the liquid quickly and the cells burst and are discharged as pus, if left alone to carry on their function healing takes place much more rapidly."

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HISTORICAL NOTE.

Dr. Nathaniel Highmore was the son of the Rector of Purse Candle, a little village near Sherborne in Dorset, England. He was buried in the Chancel of his father's church in 1685, where a fine slab with a suitable Latin inscription was placed to his memory, close to a Pre-Reformation brass to a former Rector and other interesting brasses of Dorset families. These slabs and brasses were still preserved in 1870, but Mr. W. D. C. Prideaux, an English dental surgeon, years later found them dismantled. Through the instrumentality of the Dorset Field Club these were restored and it is hoped that the neglected condition of the Highmore monument in Dorset will also be remedied.

(Abstract from the discussion of Mr. Herbert Tilley's paper on Antral Suppuration and reported in the Laryngoscope—1904.)

84 Carleton St., Toronto.

Faculty of Dentistry—McGill University

SINCE the inception of the teaching of Dentistry in McGill University, the work has been carried on as a Department of the Faculty of Medicine, with Dr. Thornton as Chairman of the Dental Executive.

It has now been decided that Dentistry should be carried on as a distinct unit and an independent Faculty has been established, constituted as follows:

Dr. A. W. Thorton, Dean, Professor of Clinical Dentistry; Dr. F. G. Henry, Professor of Dental Pathology and Therapeutics; Dr. J. B. Morison, Professor of Orthodontia; Dr. Geo. S. Cameron, Professor of Prosthetic Dentistry; Dr. F. H. A. Baxter, Professor of Operative Dentistry.

Congraulations, Dr. Thornton.

A Brief Outline of Standardized Designs of Partial Restorations

MAJOR W. E. CUMMER, C.A.D.C.

- Partial Restorations
  - Bridges (Root Support)
    - Fixed
    - Removable
    - (See Text Books on Crown & Bridge work)
  - Partial Dentures (Mucosa and root Support)
    - Base (Vegetable Metallic)
      - Skeleton
      - Continuous
      - Composite
    - Retainers
      - Direct Retainers (all with Occlusal Rests)
        - Precision
          - All Compound
            - Peeso
            - Ash
            - Chayes, etc.
        - Non-Precision
          - Simple
            - Clasp
              - Wrought
                - Wire
                  - Various Roach Clasps
                  - Various Half Round Clasps
                - Band
                  - Clasp, ordinary
                  - Clasp, Friction Lined
                  - Clasp, Relieved for fault enamel
                  - Clasp Window
                  - Clasp with cast contact and Occlusal Surface
                  - Clasp for Opposing Wedge Tooth
                  - Clasp interlocking
                  - Clasp, quarter, half, and full Occlusal Pads
                  - Clasp Multiple for 2 or 3 teeth
              - Cast
                - Wire
                  - Half round for short tooth
                  - Nesbit with 45° O. rest
                - Band
                  - For Parallel Tooth for Extra Friction.
                  - Roach M-D clasp
                  - Roach B-L-Clasp
              - Composite (Wrought and cast)
                - Various Types with Roach Embrasures, Hooks, and Similar
            - Crib
            - Adhesive Force
            - Interlocking Force
          - Compound
            - Roach (No. 1,2,& 3
            - Stud
            - Ring and Stud
            - Double Opposed Stud
            - Double Opposed Stud and Ring
            - ThorntonStaple etc
      - Indirect Retainers
        - Contact only
          - Surface
            - 14 G. Wire one-quarter Occlusal Pad
          - Recessed
            - 14 Gauge Wire oblique in inlay
        - Carrying Stress. Mastication
          - Surface
            - Quarter Occlusal Pad
            - Half Occlusal Pad
            - Three-quarters Occlusal Pad
            - Full Occlusal Pad
            - Two-thirds Rigid Loop
            - M-D Clasp
            - Upper Cone of Clasps
          - Recessed
            - 14 Gauge Wire oblique in inlay 45°(with half round cast clasps only)
    - Teeth
      - For Vulcanite attachment
      - For Gold attachment
    - Attachment
      - Vulcanite
      - Gold
    - Occlusal Rests
      - Surface
        - Quarter Occlusal Pad
        - Half Occlusal Pad
        - Three-quarters Occlusal Pad
        - Full Occlusal Pad
        - Two-thirds Rigid Loop
        - M-D Clasp
      - Recessed
        - 14 Gauge Wire oblique in inlay

THE above abridged synopsis might be compared to the stock room of a great Assembly Warehouse containing all of the standardized and necessary finished and semi-finished parts, which only require intelligent assembly to produce any of the standard designs of Partial Denture which will fulfil all necessary functions in all, save the extraordinary cases.

MENTAL PROCESSES IN DESIGN OF PARTIAL DENTURES.

Standardized products, such as motor cars and trucks are built up with the chassis or frame as a basis, all other parts, as wheels, driving gear, etc., harmonizing with this—and in the large auto plants the parts are drawn from the great storehouses for assembly in the amazing and effective fashion of the twentieth century. The architect plans his structures, which are different in each case depending on requirements, upon character, position and location of the land, which are available with modifications for the special purposes for which the building will be placed. Within his mind is a well ordered, but an immense mass of detail of standard details such as structural steel parts, etc., partly corresponding to above synopsis, various types of external and internal fittings and systems, etc. A gradual mental collection or assembly of parts of the building from these is made, first, depending upon the character of the support, then a system of devices for stabilizing a building upon its foundation against wind and other disturbing stresses (corresponding to retention in Partial Denture design), then the assembly of chosen steel and concrete parts, and finally the organization of the minutiae: which gradually results, first, mentally, then upon paper and finally in reality an enduring monument of usefulness and beauty. Approaching this parallel is the design of Partial Dentures—primarily a question of foundations first arises in the mind of the Partial Denture architect. Before him are three different types of media upon which his structure may be erected—first, the teeth themselves and, of course, most efficient; next, in order of efficiency, the teeth and the mucosa in combination and thirdly, the mucosa itself. A choice is first made. From this detail in the mind of the Partial Denture architect arises the question upon which the whole of the subsequent design depends, to wit, the choice of retention.

THE POSITION OF THE DIRECT RETAINER AS A BASIS FOR CLASSIFICATION AND DESIGNS.

In direct parallel to the problem of the architect who first chooses foundation for his structure, then arranges for retention against disturbing stresses is the problem of the dentist, who first chooses foundation, then retention. In the choice of retention, two items present themselves for decision, first, the position for the retaining device, second, the retaining device itself.

THE CHOICE OF POSITION FOR THE RETAINING DEVICE.

In a vast majority of cases, two teeth chosen from remaining teeth are all that are necessary for the secure and effective retention of the average design of Partial Denture. As may be noticed in Figure 2, these may be placed diagonally opposite, diametrically opposite, or beside one another on the same side of the mouth with spaces of intervening length between. Upon this basis exists the most practical classification of Partial Dentures. All Partial Dentures, with two direct retainers diagonally opposite, may be spoken of as Class 1 cases. All of those with Direct Retainers, diametrically opposite, may be spoken of as Class 2 cases, and all of those with Direct Retainers in line and on the same side of the mouth, Class 3 cases. A Fourth Class involves the use of three or more Direct Retainers, a design which is less favorable as a rule than any of the three foregoing, inasmuch as it is desirable to both, from an economic and

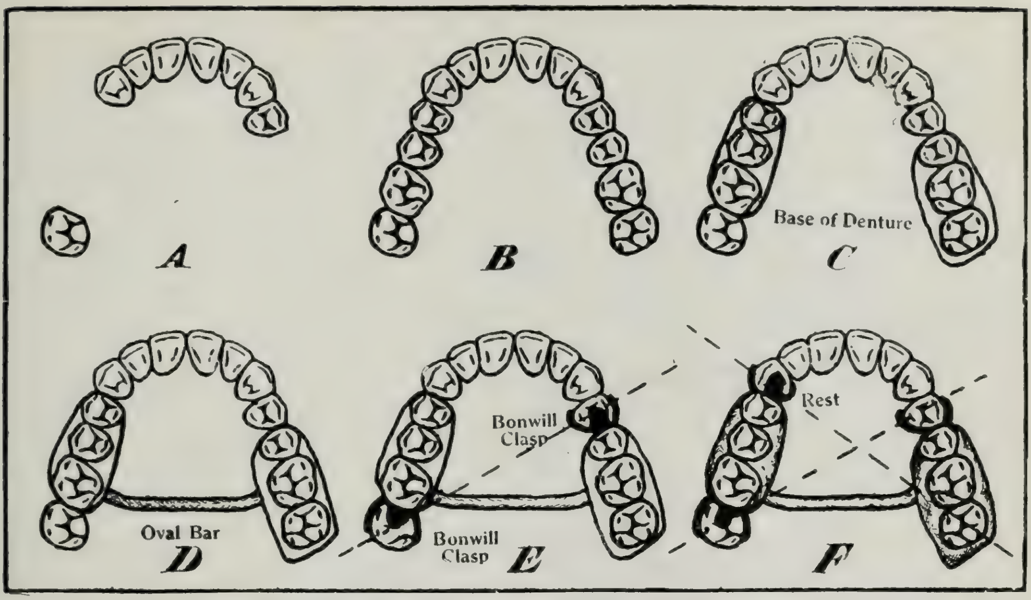

Figure I.—Stages in Design of Partial Denture.

(a) Condition of patient's mouth as presented.
(b) Printed diagram of upper teeth.
(c) First stage in development of design on diagram; missing teeth are enclosed in a line which also outlines saddle.
(d) Next stage in design; saddles joined by elliptical bar or bars.
(e) Next stage; Direct Retainers are chosen and inserted. The above instance, the Direct Retainers are chosen diagonally opposite, which classifies this case as Class 1.
(f) Occlusal rest or rests next inserted, completing design.

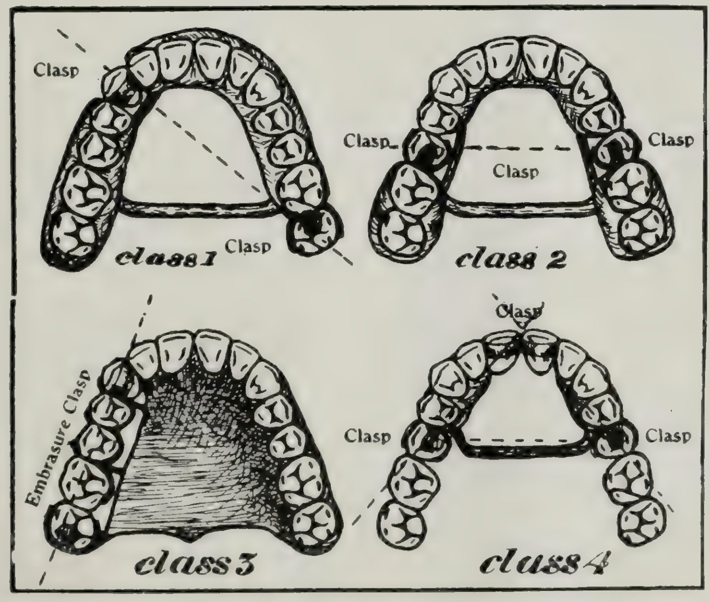

Figure II.—The Four Classes of Partial Dentures with Position of Direct Retainers as a basis.

1. An example of Class I.; Direct Retainers, diagonally opposite.
2. An example of Class II.; Direct Retainers, diametrically opposite.
3. An example of Class III.; Direct Retainers in line of one side of the mouth only.
4. An example of Class IV.; Triangular (and occasional quadrilateral disposition of Direct Retainers).

Note.—In above classification, Class 1 and 2 is based upon the use of two Direct Retainers only with Indirect Retainers. Class 3, the Transition Class, may have two or more Direct Retainers and may or may not have Indirect Retainers. Piece is held three or more Direct Retainers in triangular (as above) or quadrilateral disposition of three or four Direct Retainers.

sanitary standpoint to embody in the design as few Direct Retainers as possible, two being the minimum.

THE CHOICE OF TYPE OF DIRECT RETAINERS.

In the above synopsis, no less than thirty-six different types are enumerated; out of these thirtysix, the clasp and its modification are decidedly the most desirable because, in their use, no cutting of tooth tissue is necessary. These are chosen and placed in their relation, either diametrically or diagonally or in sequence, or in a triangular or rhomboid relation, as indicated by the position, and preferably upon paper.

COMPLETION OF DESIGN AFTER DIRECT RETAINERS ARE PLACED

The completion of the average design, this having been accomplished, means, as a rule, only the outlining of the saddles, joining of these saddles by either elliptical bar material or 14-gauge wire, and a choice of materials used in base attachment, and character of teeth. Figure 2.

The above synopsis is not set upon paper with any view of adequately covering this subject, but of merely suggesting to those whose eye may light upon it a rational and psychological process in evolving sane, practical and economical designs for the restoration of teeth lost in the mouths of the average semi-edentulous patient.

Toronto Dental Society

AT the December meeting of the Toronto Dental Society, important resolutions were introduced and unanimously carried, bearing upon the subjects of Dental Office Inspection, Industrial Dentistry and Hospital Dental Service.

DENTAL OFFICE INSPECTION.

Resolution Introduced by Dr. H. A. McKim on behalf of the Executive Committee:

At the last meeting of the Board of Directors of the Royal College of Dental Surgeons the following resolution was adopted:

"That, inasmuch as it is essential in the interest of public health that all Dental Offices should be conducted with every consideration to sanitation, this Board is of the opinion that some system of inspection of Dental Offices by a competent person approved by this Board, should be instituted, and that a small Committee be appointed to suggest the best method of securing such inspection and that the same Committee be instructed to make an effort to have the Profession of Dentistry properly represented in the proposed Provincial Department of Health."

The Executive Committee of the Toronto Dental Society considered this question at its last meeting and after very thorough discussion of the whole matter decided to ask the support of the members to the following resolution:

"That the Board of Directors, R.C.D.S., be assured of the support of the Toronto Dental Society in arranging for Dental Office Inspection for the Province of Ontario, providing an officer be appointed who would have the confidence of the Dentists and who would encourage higher standards of practice and post-graduate work, rather than confine his activities to disciplinary action, and that if necessary the annual licentiate's fee be sufficiently increased to meet this expense."

Carried.

DENTAL HOSPITAL SERVICE.

Resolution introduced by Dr. Wallace Seccombe on behalf of Oral Hygiene Committee:

The Inspector of Hospitals for the Province of Ontario has officially reported to the Government as follows:

"The time has arrived when every hospital throughout the Province, particularly in its larger centres, should consider the advisability of establishing a dental service in connection with the hospital. This is considered necessary by many of the medical profession if the best interests of the hospital patients are to be served. This should be established upon the same basis as the medical and surgical service. This service could be made hygienic as well as curative. The medical profession are a unit to-day in believing that many of the ills that flesh is heir to are due to defective teeth and septic conditions in the oral cavity.

"It was probably never clearly realized before the number of people who had defective teeth until we began examining recruits for overseas service. Thousands of men were rejected and this became so serious that the Militia Department opened dental clinics where these conditions were remedied and men made fit for service.

"Medical inspection of schools has shown that at the initial inspection over 90 per cent of the children have defective teeth which has a deteriorating influence on their school work besides being a menace to their health.

"Many people cannot afford to pay for dental treatment and the teeth are neglected until their general health is impaired. For the deserving people of this class an outdoor dental clinic should be established in connection with the service where they could have free dental treatment. It is equally important that an adequate service should be given patients in the hospital. The various details of the service would have to be worked out according to the size and requirements of the particular community, but in any case the time is ripe for a beginning."

"Your committee believes that the time has come when there should be established in the hospitals of Toronto a dental service manned by dental graduates who would have equal standing in the hospital with the members of the other services. In addition to regular practitioners giving, say two hours per week, there would also be required adequate dental intern service to give continuity to the work. It is only by the organization of such a service that efficient and systematic dental service may be supplied to both in and out-patient departments of the hospital. Your committee would appreciate the assurance by this society of its concurrence in this plan that all our members may be counted upon to give their best support to the movement."

Carried.

MUNICIPAL, HOSPITAL AND INDUSTRIAL DENTAL CLINICS.

Resolution introduced by Dr. Seccombe on behalf of Oral Hygiene Committee:

"The establishment of dental clinics in connection with municipalities, hospitals and large industrial corporations appears to be absolutely necessary if the public are to be supplied with efficient and systematic dental service. It has been found that industrial dental clinics have brought modern dentistry within the reach of the average worker, and, from the employers' standpoint, have avoided much loss of time, and a marked appreciation in the health of the employe.

"Your committee would suggest that this society recommend to the Board of Directors of the R.C.D.S. that provision be made for the legal establishment of such clinics, under proper conditions, and that for this purpose the by-laws be amended as follows:

"Amendment to by-law No. 43

FOR THE REGULATION OF THE PROFESSION OF DENTISTRY.

Sections 1 and 2.—(Provide that dentist cannot be employed by any person not a member of the College.)

Section 3.—Nothing contained in this by-law shall prevent the Royal College of Dental Surgeons of Ontario from granting a special permit to Licentiates, permitting them to carry on the practice of Dentistry, as an employe of a municipality, hospital, corporation or company, where a Dental Clinic has been established in the interests of health and in accordance with the regulations of the R.C.D.S.

Such special permit may be granted only under the following conditions:

(a) That such clinic be carried on without financial profit to the corporation.

(b) That such permit be subject to cancellation by the College at any time when, in the opinion of the Board of Directors, the clinic is not being conducted in accordance with the spirit of the Dentistry Act and the by-laws of the Royal College of Dental Surgeons.

(c) That in the case of industrial clinics dental service be limited to actual employes only, and no other shall be given dental service in such industrial clinic."

Carried.

DENTAL NURSES COURSE.

Resolution introduced by Dr. W. H. Coon on behalf of Executive Committee:

"That the Board be requested to consider the advisability of having the R.C.D.S. Course for Dental Nurses as now given, so arranged and amplified as to make possible the training of women for the special work of the Laboratory of the average up-to-date Dental Office." Carried.

Principal McKay, of the Toronto Technical School, addressed the Society and gave a most interesting account of the scope and work of the Technical Schools.

Dr. R. D. Thornton, President of the Society, acted as Chairman of the meeting.

Dewey School of Orthodontia

THE Dewey School of Orthodontia was carried on at the College of Dental and Oral Surgery, New York, last year, and was such a success that the school will continue to be held in New York City. This will assure the registrants of an abundance of clinical material.

The building of the N. Y. C. of D. and O. S. will again be used and the Dewey School will co-operate with the College so that Orthodontia cases may be carried along and prepared in such a way during the winter months as to be of the greatest possible teaching value to the School of Orthodontia.

The course will be of eight weeks duration, and the entrance qualifications will be of the same high standard as heretofore.

The Faculty, in addition to Dr. Dewey, will include Major Joseph B. Eby, whose skill as an orthodontist enabled him to very early attain a position of importance in the Maxillo-Faciale Department of the Walter Reed Military Hospital at Washington, D.C.; and Lieut.-Col. V. P. Blair, who was the chief consultant in the Maxillo-Faciale division of the American Expeditionary Forces. The School is equally fortunate in having in its faculty such men as William K. Gregory, Professor of Vertebrate Paleontology of the Columbia University, New York City, and Dr. Milo Hellman, whose work on the evolution of the face and morphology of the teeth is well known.

Home and School

Devoted to the interests of Dental Health in the Homes and Schools of the Community

This Department is Edited by
F. J. CONBOY, D.D.S., Toronto
Provincial Dental Officer, Department of Education, Ontario

LORD FISHER in one of his explosive letters to THE TIMES says that the following maxim was given to him by a friend years ago:

"Fear Less — Hope More;
Eat Less — Chew More;
Whine Less — Breathe More;
Talk Less — Say More;
Hate Less — Love More;
and all good things are yours."

* * * * *

The little town of Chazy, situated four or five miles north of Lake Champlain, with a total school population of 500, has the best dental equipment that can be secured; also a dentist on full time to take care of patients. This shows what can be accomplished in a small community.

* * * * *

The results of five years of school dentistry and oral hygiene at Bridgeport, Conn., show that the cost of re-education has been reduced 59 per cent, tooth decay in 15,000 children reduced 33 1-3 per cent, children who failed to pass examinations, reduced 50 per cent; and the death rate from diphtheria, scarlet fever, and measles was reduced 70 per cent. During the influenza epidemic the death rate at Bridgeport was the lowest in the state. The annual report of the Provincial Board of Health for 1918 reveals the following:

	Cases.	Deaths.
Scarlet fever	2,862	84
Diphtheria	3,093	335
Measles	9,431	95
Whooping Cough	2,372	305
Tuberculosis	——	2,129

The deaths from scarlet fever, diphtheria and measles combined numbered 514.

The children who died from these diseases and who might be still alive had we had an efficient school dental system, number 360; add to this the larger number of deaths from whooping cough, tuberculosis, influenza, and other communicable diseases, where the infection which caused the disease was carried around in a neglected mouth; add to this the number who died from cancer because they were not instructed in regard to the danger of allowing the sharp edges of teeth and roots to continually irritate the soft tissues; add to this the enormous number of deaths from heart lesions and other diseases, the primary cause of which was focal infection in the mouth; add to this the large number who died from diseases caused by having pus passing from mouth into the lungs or into the alimentary canal, those who die from diseases caused by nerve pressure and by being unable to properly masticate their food; and you will have some slight idea what it costs a province to neglect to provide an adequate and efficient system of school dental inspection and treatment.

* * * * *

The estimates submitted by the Toronto Board of Health provide for a substantial increase in the number of school dentists. It is to be sincerely hoped that the City Council will support the recommendation, as an increased staff is urgently needed if the work is to be carried on successfully and the best results accomplished.

A Modern Education

EDUCATION to-day is based on a utilitarian foundation. A man with a knowledge of the languages, for instance, is not necessarily an educated man. Formerly, the school aimed at *learning*. Now it includes *living* and *doing*, which in a good education is as prominent as the learning. Such an education fits one for his vocation and the duties of life.

It has been said that "Not politics, not finance, not machinery, not commerce, but education in the large and deep sense of the word, is the first and highest concern of a people; and the truest patriots are not party leaders, not captains of industry, nor inventors, but teachers,—the men and women who live and labor to make themselves and all who are brought under their influence,—wiser and more useful and happier."

Only as an educational system develops the child into a good citizen, prepared to fill a useful place in the community, is the State justified in spending large sums of money annually upon education.

Departments of Dental and Medical inspection of school children find their place in a modern educational system, because in the process of developing good citizens it is recognized that a clean, healthy body is a first and essential consideration.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

The Late Sir William Osler.

REFERRING to the recent death of this distinguished Canadian, the editor of The British Journal of Dental Science says:

"With the passing of Sir William Osler, Oxford has lost a great teacher and the civilized world a great physician. But the loss to humanity does not end there, for Sir William was a man of very many parts. A physician who taught—as he would himself have agreed—learned his art, in three widely different centres of learning, Osler was able to take wider views of life, of men and of medicine, than usually is possible for a teacher in the Healing Art. Few men possessed so charming a personality and perhaps none a wider range of knowledge, more enthusiasm or more genial tact in dealing with the brotherhood of medicine. As a life-long lover of books, Osler had collected many rare treasures, and knew as much about books as he did concerning their authors and humanity in general. His encyclopaedic knowledge was always at the disposal of others, and no correspondent, however humble, went without an answer from the Regius Professor of Medicine in Oxford. The History of Medicine was one of his hobbies, and few aspects of that fascinating theme were unfamiliar to him. As a clinician Osler was a clear thinker and gave excellent advice. His books are written in a pithy style and are full of useful information."

Teeth, Dietetics and Physique.

We hear and read so much about the relation of the teeth to systemic conditions that we have become almost bored with it. The subject has been dealt with *ad nauseam*; but we cannot get away from facts. If the teeth of the present generation are worse than those of previous generations, and if poor teeth mean poor health, as we are so frequently reminded, then it follows that the general health and physique of our generation must not be up to the standard. Is this the case?

In a paper read before a School Dentists' Society in December of last year, Charles E. Hecht, M.A., M.C.A., quotes from a report of "The Food Education Society" (London, Eng.), in which this passage is cited from a member in the far north of Scotland*:

"In the Highlands the deterioration of physique, even during my own recollection is so marked as to cause concern to all. When I was a child I remember well what splendid-looking men were to be found everywhere, and especially do I remember their beautiful teeth. Now very few have good teeth, and except on the more distant crofts (where they still keep much to their old food and habits), the men are not superior and in some cases even less fine than in towns and in England, while the women are much more affected. Many have lost all their teeth by the time they are 25 or even younger. They drink strong tea five or six times a day and live on white bread and canned meats. Many of them are anaemic, and most suffer from violent indigestion, in spite of coming from such healthy stock and living in the most beautiful air in the world. Their homes and general sanitation are much improved from that prevalent in their parents' time, so that, though I know it is below the English standard, that cannot be the reason."

Ignorance of the physical laws of dietetics affect the whole nation. Rickets and poorly-formed teeth are some of the common consequences of faulty diet. Little headway can, therefore, be made towards correcting the present unfortunate condition by simply filling up cavities in the teeth, if we neglect to put into operation some other effective prophylactic measures as well. The regulation of the diet is certainly an important function.

Scotland is not alone in regard to impoverishment of physique. A Welsh officer of health, in a letter which appeared in THE DAILY MAIL of March, 1910, says: "The food of the Welsh in these parts, up to fifty years ago, was of much more strength-giving character than at present, namely, milk, oatmeal as cakes, flummery, etc., barley-meal bread and wholemeal bread with home-made cheese, in conjunction with bacon, beef and mutton with vegetables. Now the majority take tea four or five times a day, with emasculated wheat bread and butter, foreign cheese and a little meat and vegetables. The result is that the nation is degenerating physically. On examining school children I found scarcely 2 per cent with sound teeth, about 10 per cent requiring spectacles, and a very few with normally developed bone and muscle. Most of the mothers are dependent on 'shop' teeth, many are unable to suckle their infants; and most of the youths are cigarette-sucking punies. I consider the laws of the land are much too lax with reference to comestibles."

In England, the conditions are no better. Reports go to show that in places where the housing conditions are better than the average, the air healthy, wages good and with plenty of food, the same unfortunate dental ailments prevail. In one village nearly all the inhabitants were found to have lost their teeth before reaching the age of 21. It was found that the better-off the parents and the higher their social position the worse the physical condition of their children and their teeth. School children live mostly on pastry, iced cakes, bread and jam. Even children from the age of two months are often given tea.

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*British Journal of Dental Science, Feb., 1920.

An inspection of one of the Homes for Children showed that the diet was likely to produce abundance of dental ailments as well as an impoverished body. Fats are not given in sufficient quantity. The children are crowded too closely at the tables when eating, are not allowed to talk; consequently they eat with great haste. Toothbrushes are almost unknown, except amongst the older pupils.

As a means of preventing the common ills of our present foods it is suggested as follows:

Puddings and porridge be as compact as possible, so as to encourage mastication.

Hard biscuits, or crisped bread, might be on the table at all meals, and their use, instead of bread, encouraged.

Eating at the mid-morning meal and at afternoon tea should be reduced to a minimum.

As alternatives to white bread, brown bread made from wholemeal flour finely ground and thoroughly cleansed, or old-fashioned cream-colored household bread, containing about 80 per cent of the grain, including the germ and the semolina, should be provided.

Proper intervals allowed between meals.

Excessive drinking at meals, or immediately before or after, to be discouraged.

Immoderate use of condiments, pickles, sugar, etc., to be discouraged.

Thorough mastication of food before swallowing it (Horace Fletcher's theory).

End a meal, not with sweets, but with a raw apple, orange, lettuce, cress, radish or celery.

Do not use starchy or sugary food the last thing at night.

Do not drink freely at meals. The only animal that does this is the pig. Prize pigs, we are told, are always raised on a dry diet!

PULP REMOVAL.—It is my conviction that there is often more probability of trouble in the disturbance of tissues, than if a small portion of pulp has been left undisturbed. Tissues once impaired by traumatism are never again so resistant to infection as they were originally.—(*A.E.W.*)

Professionalism vs. Commercialism

I WISH I could make this message sufficiently strong so that it would sink into the consciousness of every man practising dentistry. The traditions of the profession are such that no man need blush when he considers the development of dentistry from the days of the barber, the blacksmith, or the one or two pairs of forceps in the drawer of the average surgery. It has been a steady growth from this up to the present-day highly-developed science and art of dentistry. This growth has come not through concentration on the business side of dentistry, but by a constant devotion to the highest professional ideals, and the strict observance of ethical standards. It is true that there are many men in dentistry to whom the essence of professionalism does not strongly appeal, but there are a goodly number of others of whom it may be said to be a part of their very existence. And it is these men who have raised dentistry to its present important position among the professions. Without their devotion dentistry would have drifted along as a mediocre calling, and would never have commanded the respect it enjoys to-day, nor would it in truth have had any recognition as a profession at all.

Those facts should make us pause and contemplate the effect on the status of dentistry if commercialism is permitted to enter into its ranks and dominate its policies. And there are certain tendencies in operation to-day which point in this very direction. The dollar sign was never more prominent than it is at present, the boasting of high fees was never so rampant.

Away back of every achievement there must be the mainspring of motive. If the motive of doing a piece of dental work is merely the amount of money the operator is to receive for it, then the chief inspiration for doing good work is gone. No man can continually put his very best into any effort if the sole incentive is money, and this is particularly true of professional men. There must develop in the man a love for his work, an impulse, an urge which stimulates him to his best effort for the sheer sake of achievement. Then his work becomes something apart from drudgery, something which lends a sweet savor to his every-day endeavor, and leaves him refreshed and inspired through the tonic of achievement.

But let a professional man concentrate his energies on the mere making of money, and his better impulses are dwarfed at once. He loses sight of the finer aspects of professional life, and becomes sordid and narrow. There is no more pathetic picture than that of the dentist who is following his calling solely for the money there is in it—and many are apparently doing this to-day.

This commercialism which has crept into the profession is quite commonly attributed to the general tendencies of the age—which may be said to be intensely commercial. There never was such a period of profiteering in the history of the world, and it has grown to the point of being a disgraceful evil. Every line of effort seems permeated with it, and when the price of all kinds of commodities has gone up there is little to argue against a raise of professional fees to meet the emergency. But this is not what is meant in the present contention. Adequate fees are necessary, but the exploitation of the people by professional men, whereby the financial side is elevated beyond the professional side is not necessary. Imposition on the public is bad enough in those pursuits which are known as strictly business callings, but it is infinitely worse when it enters the professions.

There are many phases of exploitation which are apparently gaining ground among the professions—too many to mention here—but it is hoped that dentistry, which has gained its status through other means, will hold itself aloof from following the fleshpots, and be known as a profession which has above everything else a wholesome respect for equity and justice and a resolve to follow professional rather than commercial lines.

C. N. Johnson

Exposed Necks of Teeth.—When the gums are retracted, and the tooth sensitive about the neck, rub a little bicarbonate of soda along the edge of the gum with the finger, or dissolve about a teaspoonful of the soda in half a glass of water and rinse the mouth thoroughly with this.—(*L.B.*)

Sensitive Dentin.—A special remedy is a combination of chloroform, ether and menthol, applied with a hot-air syringe. This has seldom failed, even in the most extreme cases, it makes the operation at least bearable.—(*R.C.MacL.*)

ORAL HEALTH

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EDITORIAL

Mind Tests for College Students.

IN the United States Army during the war a system of psychological tests were developed, for the purpose of ascertaining a man's natural ability and mental strength, and his fitness for special lines of service. It is claimed by those who are familiar with the results of these tests, that they proved of great value in detailing men for that kind of army work for which they were best suited.

It should be appreciated at the outset that the man who conscientiously applies himself to his work, and is a failure, is primarily a failure because he is engaged in work to which he is not naturally suited. This principle is freely recognized among large employers of labor, and where a man does not prove successful in one position he is transferred to another job, until the work for which he is best suited is found. Thus the individual is given a real chance to succeed.

It is reported that Columbia University is to sort out candidates for different courses by means of a series of psychological tests. In other words, a young man who presents himself for a certain course will not only have to meet the academic entrance requirements, but will be tested as to his natural capacity and fitness for the career he plans. The idea is to get the measure of the man's mind, so that he will not prove to be a "square peg" in a "round hole," and thus avoid many cases of failure. This plan may prove to be important in directing men into the profession for which they are best fitted.

Some of the test questions employed are:

"I am going to name two things which are alike in some way, and I want you to tell me how they are alike. Wood and coal; in what way are they alike? Or the pupil is asked to tell the meaning of an abstract term like pity, revenge, charity, envy, or justice. Here is another: "Now I want to see how many different words you can name in three minutes. When I say ready, you must begin and name the words as fast as you can, and I will count them. Do you understand? Be sure to do your very best, and remember that just any words will do, like 'clouds,' 'dog,' 'chair,' 'happy'—Ready; go ahead."

It will not do, however, for advocates of this plan to be too enthusiastic regarding results. In fairness to the students it would be much better, in place of rejecting candidates, to make the tests for purposes of record only, and then observe, over a period of time, whether those who passed the tests excelled in any marked way those who failed to pass them. One does not feel at all sure that the "psychological testers" will be capable of applying fixed tests to young men who may all be of average ability, but widely different in disposition and character,—some aggressive and confident, others shy but proud.

It would require a brave man, who as teacher has watched a class progress throughout the Freshman year, to determine those who will prove undoubted failures in the course they have entered. It frequently happens that the greatest men were not, when at school, conspicuous as students, and upon the other hand, students for whom great careers were predicted have not amounted to much.

Ontario Dental Society

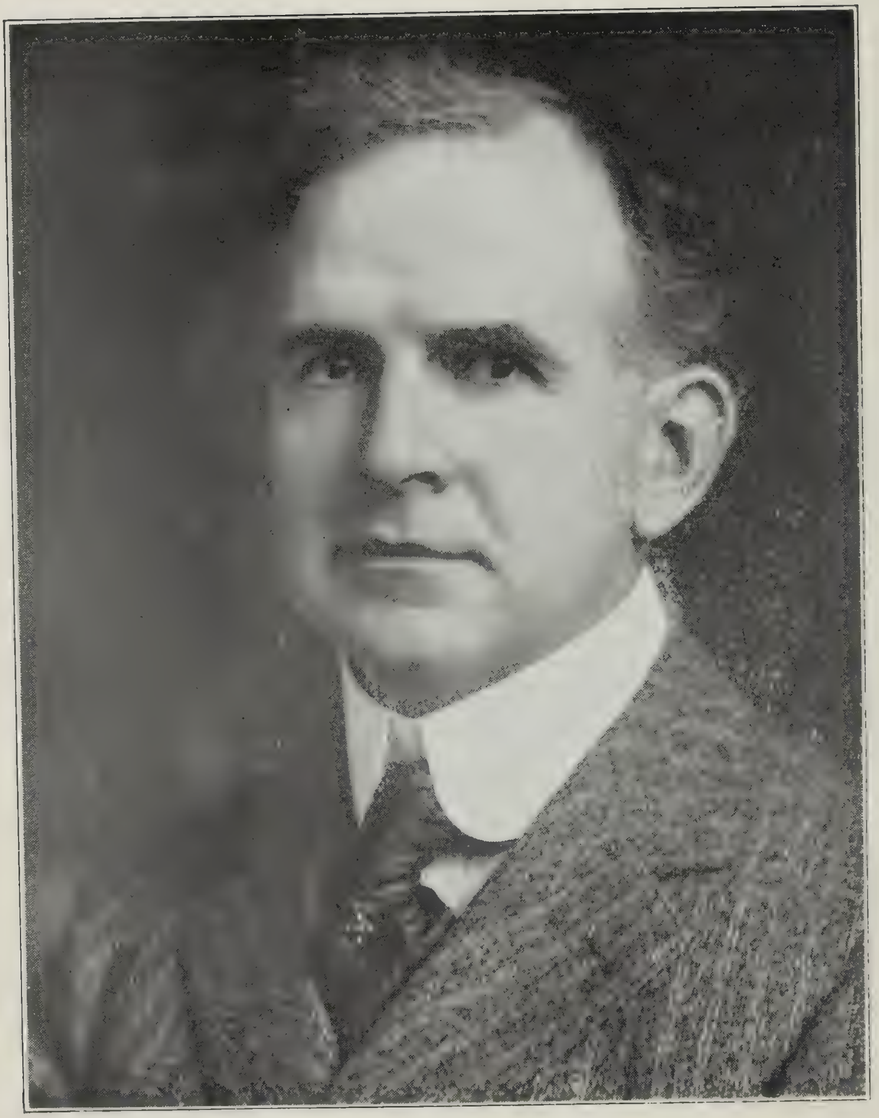
THE Fifty-third Annual meeting of Ontario Dental Society, will be held in Toronto, Ont., May 3rd, 4th, 5th, 6th. Progressive Clinics will be a feature of this meeting.

In connection with the Ontario meeting this year there will be held the official opening of the extension of the Royal College of Dental Surgeons. Numerous chair clinics will be held during the afternoon and the opening ceremonies in the evening, following a complimentary buffet supper to which all of the members of the profession will be invited.

J. A. BOTHWELL,
Sec'y., 2 Bloor St. E., Toronto.

The Law of Succeeding

"IT is always the case, that the price that must be paid for succeeding is still harder and more patient and more enthusiastic work. And unless this price is paid, the value and results of your one success soon go, and a lot more with them."



CHALMERS J. LYONS, D.D.SC., ANN ARBOR, MICH.

Professor Oral Surgery, Dental Department, University of Michigan.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, APRIL, 1920 No. 4

A Discussion of Factors That Must Be Considered in Determining Conservative or Radical Dental Treatment*

CHALMERS J. LYONS, D.D.SC., ANN ARBOR, MICH.

Professor Oral Surgery, Dental Department, University of Michigan.

ONE of the most important advances which has been made during the past decade in the science of medicine, which in its broadest sense must include all branches of the healing art, has been the development of knowledge concerning the role which disease in one part of the body plays in the etiology of disease in other parts. The recent advances in dentistry have brought this field of work into very close relationship with that of medicine. These recent advances have been stimulated by the demands of our sister profession that the dentist must assume some of the responsibility for the effects of some of the low grade infections.

The conscientious internist to-day takes into account the condition of the mouth in formulating his diagnosis in a large variety of medical cases. It is equally necessary for the dentist to make a careful survey and inquiry into the general condition of the patient before deciding upon dental procedure. Some of his patients will require thorough and radical dental treatment, while with others a more conservative measure will be preferable.

During the past two or three decades the conservation of tooth structure has been pressed home to the public at large so forcefully that until within very recent years it was hard to find a dentist who would advise extraction of a tooth or a patient who would submit to such an operation. During those past two or three decades, the years before the dental profession realized the importance of focal infection, when the knowledge concerning the relationship of mouth infection to systemic disease was in its infancy, the profession's main purpose was to conserve tooth structure. As a result of the extensive conservation of tooth structure many of our patients are now suffering from conditions that are far more serious than those localized in the oral cavity. As a further result of the profession's efforts in the past to conserve teeth, we are to-day confronted with a condition which threatens to destroy conservative dental treatment. To-day the pendulum is swinging out too far in the eradication of teeth for the purpose of relieving some systemic lesion. The dental profession to-day is standing upon slippery places, and we will do well to keep our feet on the ground.

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*Read before the Toronto Dental Society, 16th February, 1920.

The dentist now must take a much broader view-point of his profession. It is a question whether dentistry as a whole even now, after all that has been written on focal infection, appreciates the magnitude of its responsibilities. It is to be regretted that there are still hundreds of dentists who believe their responsibility begins and ends in conservation of tooth structure. When a patient presents they seem to feel that their responsibility ceases when they have examined the teeth for dental caries. They do not feel they are responsible to that patient for any other lesion that may be present in the oral cavity. They fail to examine the mucous membrane, cheeks, tongue, tonsils, sinuses, salivary glands, etc. They fail to get the patient's history of past or present illness; they do not take into account the resistance of the patient to disease.

They prosecute the same general dental treatment for all classes of patients. What would we think of a physician giving the same size doses of medicine to all his patients for all diseases? This is exactly what by far too many dentists are doing and then we wonder at the criticism that we are receiving. It has been well said that "a dentist would be a better dentist if he were a better physician," and that saying has never proven so true as at the present time. It seems to the writer that the highest aim for the dentist of to-day is not merely to be a good dentist, but to be a good dental diagnostician. If he is a good diagnostician he cannot help but be a good dentist.

It marks a great step forward in health preservation that the many scientific researches and recorded observations which have been brought forward during the last decade have served to prove that there is a most important relationship between certain diseased conditions about the mouth and systemic disease. Yet we must not overlook the fact in formulating our diagnosis that the mouth is only one of the places where we may look for the origin of these low grade infections.

We find the origin of these low grade infections of the body in first the pelvis which includes the urethra in the male and the tubes and ovaries in the female; second in the appendix; third in the gall bladder; fourth in the head and neck which includes the tonsils, sinuses, teeth and gums.

When a patient presents suffering from these low grade infections all of these places must be taken into consideration.

During the last decade volumes have been written on the subject of focal infections. It has been clearly demonstrated by the pathologists that many of the heart, kidney and joint lesions have their etiology in low grade infection, originating somewhere in the body. There is no question but that the subject of focal infections should be considered more seriously by both the medical and dental professions and a united front should be presented to acquire a greater knowledge of them so that they may be better controlled.

The records of the Bureau of Vital Statistics for the past twenty years are most interesting. First we see the average length of life per individual greatly increased. In studying these mortality statistics carefully we find that the causes of deaths in some of the columns are increasing and in other columns they are decreasing. For instance there seems to be a falling off in deaths due to certain diseases such as tuberculosis, typhoid, cholera and smallpox. As we continue the study of these columns we find an increase in the number of deaths from heart and kidney lesions and those due to arteriosclerosis and anemia.

It is interesting to review some of these statistics. In the registration area for deaths in the United States, the Vital Statistics show the death rate per 100,000 population from diseases of the circulatory system in 1901 was 161.2, while in 1917 it was 201.4; deaths from disease of the kidneys in 1901 per 100,000 population was 97 while in 1917 it was 107.4. It is interesting in studying these statistics to observe that each year seems to show a gradual increase in numbers.

It is also interesting to observe the statistics in these diseases when there has been an effort made to get them under control. As an example the death rate from tuberculosis per 100,000 population in 1901 was 192.6, in 1917 it was 146.3. Typhoid shows a more rapid decline. In 1901 the death rate per 100,000 population was 32; in 1917 it had dropped to 13.4.

Quoting from Prof. Martin H. Fisher, of the University of Cincinnati, he says: "Many people are dying to-day from certain diseases too frequently regarded as a necessary accompaniment of old age. In my opinion," he says, "old age is not so much of the cause of many of the pathologic changes attributed to it, but these changes are the causes of old age. There is a physiological death, but I question very much from the people and patients that I have seen whether a physiological death ever occurs much below 100 years. The question now comes up, if we no longer die of the old causes, and medical men concede that we do not, then what is it that carries us away in our forties, fifties and sixties? Barring gross accidents and such diseases as cancer and tuberculosis, we now die largely of the direct and indirect consequences of low grade infection.

We do not die of acute scarlet fever as we used to; we do not die of acute typhoid or acute pneumonia as we used to, and yet most of us do not die physiologically, that is, of old age. In many cities where formerly there were hundreds of cases of typhoid, to-day there are hardly enough to demonstrate the disease to medical students, but many of those who have been spared typhoid die by newer causes. These newer causes of death are subtler forms of infection and subtler types of disease. They are largely systemic infections, low grade in their origin, and spring from local causes and are so very small that they are largely overlooked."

To-day we have hundreds of people walking about the streets, going about their business, following the pursuits of life, who are neither well nor sick, yet they complain of feeling tired all the time. They have lost their energy. They are suffering from malaise. This is a condition of restlessness, with a feeling of being uncomfortable, which is brought on undoubtedly by a certain amount of bacteria and toxines in the blood. This condition is quite common with those individuals carrying alveolar abscesses. The same symptoms may be manifest as a result of infection in any other part of the body. When these patients present for treatment, all sources of low grade infection in the body must be considered and the infection eradicated wherever found. Dr. Chas. H. Mayo, in an address a short time ago, made the statement: "As we see things to-day, it means there will be far less surgery and less sickness when the full benefit of the knowledge of low grade infections becomes known throughout the world."

In running down these low grade infections we must not overlook the fact that multiple infection is nearly always present, and if we do not get definite and prompt response in eliminating one focus it means that we have failed to completely eradicate it, or that there are others not yet determined. In many of these cases the removal of a single focus will so lighten the patient's load that the body forces will reassert themselves and the phagocytic action of the leucocytes will take care at least temporarily of other infections. In these cases a lowering of the bodily resistance from any cause may re-establish the vicious cycle again and the patient will have a relapse. If this be true, then we are doing less than our duty towards the patient where we do not strongly recommend the removal of every possible focus of infection wherever it may be found.

These foci are not by any means easy to determine. A close co-operation between the internist and the dentist will be of great value in running down these low grade infections.

The time is coming when future generations will no longer die of disease as a result of low grade infections as we are to-day, because the source and prevention of these diseases will be known. Periods of progress in both medicine and dentistry have occurred only as scientific and general knowledge has advanced. Wonderful strides have been made in all lines of medicine during the past quarter of a century by the public's appreciation of disease and its prevention. Public health laws have been passed for the control and prevention of disease as well as for the saving of children. Such legislation has played an important role in diminishing the death rate of the nation during the last three decades.

Are we as dentists doing all we can in the great movement for the conservation of health? The protection of human life against its destructive agents becomes less complex when the source and influences of these destructive agents are understood. By this knowledge Gorgas was able to free the Panama Canal Zone of disease, making it one of the most habitable places in the world. The great war was only carried on by prevention and control of disease and the scientific treatment of wounds.

What is the responsibility of the dental profession to-day in the prevention and control of disease? It has been definitely demonstrated, first by Hunter of London, later by Rosenow, Billings, Hartzell, and many other American physicians and dentists that certain chronic diseases, certain acute diseases and special local diseases have their origin in a focus of infection somewhere in the human body. It has also been demonstrated that appendicitis, disease of the gall bladder, and ulcers of the stomach are caused by a mass of bacteria in the capillary circulation at the base of the mucous cells in these organs, and is caused in the same manner from local infections originating from somewhere. It has been further demonstrated that the toxines from certain micro-organisms in the blood play a most important role in the etiology of disease.

As has been stated elsewhere in this paper, there are several sources in the body for the entrance and culture of bacteria in a local focus. In the head we have several sources for the entrance of bacteria. It has been stated by one of our great research workers that the tonsils provide the greatest portal of entry for infection of any place in the body. Diseased teeth and alveolar tissues is unquestionably another great harbor for these micro-organisms. From the laboratory and clinical evidence that has been brought forward during the last five years there can be no question regarding the relationship between mouth infection and certain systemic lesions. The intelligent dentist to-day should have no patience with such teaching as has been brought out in a recent paper by an eastern research worker, (*) in which he states that he "does not believe systemic diseases upon the focal theory of infection are correctly attributable to the teeth." Quoting further, he says, "If it were true that the teeth were causative factors in the production of systemic disease, there would be few healthy individuals in the world. For example, among fifty thousand cases observed in the Forsythe Dental Infirmary with all varieties of lesions involving the teeth there was not a single case of endocarditis, rheumatism, arthritis, or other systemic affection which could in any way be attributed to the teeth that I could discover. If the theory of focal infection were sound and correct a great many of these children should have exhibited such diseases, but the fact remains that they did not."

In the writer's opinion these statistics should be considered far from the final evidence that there is no relationship between diseased teeth and systemic disturbances. Those statistics have been compiled entirely by what has been observed in the treatment of children's teeth. As a matter of fact, the greatest factor to be considered in discussing this subject has entirely been overlooked by the author of those statements, and that is the normal resistance of the patient to disease. As a matter of fact, further, the normal resistance of a child is much greater than that of the adult, and they already have an established immunity to systemic lesions as a result of low grade infections. The records of our own dental clinics at the University of Michigan tell an entirely different story.

Out of eight thousand patients examined, over two thousand four hundred, or thirty per cent, gave history of some systemic lesion such as arthritis, heart or kidney involvement. In a series of cases between the ages of 25 and 40 years, where there was radiographic evidence of pyorrhea involvement or definite alveolar abscess, 58 per cent gave history of systemic lesions. It should not be understood for one moment that all of these lesions are attributable to the teeth, and this is the big question to-day that the dentist and the internist must solve. They must get these three points clearly in their minds: First, diseased dental tissues may cause systemic lesions. Second, there are many other sources of infection in the body than the teeth and dependent structures. Third, the normal resistance of the individual to disease must be the predominating factor in determining the character of the treatment.

This factor is one that has been, and is to-day, largely overlooked by the average dentist and internist. Very few adults are without some form of infection in some part of the mouth, and the knowledge of the same to the patient is not present. That serious secondary manifestations are not more common as a result of these foci is probably due to two factors: First, the normal resistance of the individual is such that bacterial invasion into the lymph and blood streams is repelled. Second, the bacteria of chronic processes are usually of relative low virulence. If it were probable that the individual's resistance to disease would remain high, and that the bacteria in these foci would remain of low virulence, then we would not need to be alarmed over the problems of focal infection. However, Rosenow has shown that these pathogenic organisms may not always remain of low virulence. He believes they have the property of mutation, whereby they may be of low virulence to-day when the individual's resistance is sufficiently high to take care of them. Later, if the individual's resistance becomes lowered, the future generations of the same low virulent pathogenic micro-organisms may take on different characteristics and with suitable environment and nutrition may become exceedingly virulent.

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*Howe, Dental Foci, Dental Summary, Oct. 1919

On the part of the individual, the resistance to infection may be lowered by a large variety of causes, such as drug habits, tuberculosis, anemia and other blood diseases, disease of the ductless glands, mineral poisons, pregnancy, old age, overwork, lack of proper nourishment, faulty methods of living, exposures to cold, etc., etc. In these patients oral and other forms of sepsis are a greater menace to health than in the cases of normal individuals.

Dentistry to-day must meet and encounter these problems squarely if it is to take the place it deserves in the conservation of the public health. Dentistry can no longer be practised as it has been in the past. In the years gone by the profession has been chiefly engaged in the conservation of tooth structure without reference to or knowledge of the fact that in such practice they were subjecting many of their patients to serious systemic disturbances. To-day the knowledge of the relationship of mouth infection to systemic disease is becoming known throughout the world, and there should be no excuse for the dentist to continue the practice of tooth conservation as he has done in the past.

In the writer's opinion we are not yet ready to accept the teaching of some men in the profession that all pulpless teeth are a menace to humanity and should be extracted. Such teaching should be condemned as vicious, and should have no place in modern dentistry. We are not ready either to accept the teaching that all classes of patients may tolerate pulpless teeth. There surely must be a middle ground for dentistry to take which will lead to a saner and safer practice.

The dentist who will build and mold his practice for the future, a practice which will be safe for his patients, will practise two kinds of dentistry, viz., conservative dentistry and radical dentistry. The determination of the future dental treatments must be based more and more upon the results obtained by a thorough examination of the patient. The dentist must assume a greater responsibility to his patient than the mere restoration of the masticatory organs.

The resistance of the patient to disease must be uppermost in the dentist's mind when treating pulpless teeth. We must not overlook the fact that certain types of patients may tolerate successfully a certain class of dental work, whereby it would be a failure in another patient of less resistance. If the patient's resistance is low, radical dentistry should be practised. In the writer's opinion the resistance of the patient to disease must be the great determining factor in the practice of conservative or radical dentistry. There never was a time in the history of dentistry when a close co-operation between the physician and the dentist was as necessary as now. There was never a time in medicine when the physician needed the advice of a dentist as at the present time.

To-day the problem of focal infection is one that must be studied by both professions, and can only be solved by absolute harmony and the closest co-operation between the two. It is unfortunate to-day that both the physician and the dentist are placing so much confidence and dependence upon X-ray findings in formulating their diagnosis. They seem to overlook the fact that the radiogram does not show a picture of the pathology, but it only shows shadows of conditions which may be present in the tissues. Many conditions may be read into the radiogram by the inexperienced. In the writer's opinion the radiogram *per se* is of little value in making a judicial diagnosis. The radiogram may be misleading many times if there is no other evidence at hand. It may show rarefied areas about the jaws that are physiologic rather than pathologic. It may also show rarefied areas that are traumatic and not infectious. It should be used only in conjunction with the case history, physical diagnosis, etc. It should be considered only one link in the whole chain of evidence from which may be formulated a sane and conservative diagnosis.

Our knowledge of the far-reaching effects of low grade infection should be sufficient reason for eradicating a focus of infection wherever it may be found. Too often teeth are condemned by the physician when the origin of the infection may be in some other part of the body.

A famous internist * recently made this statement: "There is no doubt that many cases of arthritis and myositis have been relieved and many eyes saved, and the general health of many patients improved through the reference to dentists who have corrected bad mouth conditions. One error for which the physicians are mainly at fault, is that arising from a tendency to make incomplete examinations. A patient complains of arthritis or other pain, his physician looks into his mouth, sees a few crowns, and at once condemns the teeth and advises their sacrifice, and the conscientious dentist has great difficulty in convincing the patient that the crowns are on sound roots. Now the fact is in a case of this sort the physician may be right, but, taking all things into consideration, he is more likely to be wrong. What the physician should do is to give the patient a very careful and complete examination, with the co-operation of the dentist, and then decide upon the course of action. Some years ago many alveolar abscesses remained undiscovered and undisturbed. When the dental and medical professions discovered their omission they went to the opposite extremes. Undoubtedly alveolar abscesses should be relieved, but expert dental judgment is required before condemning teeth on imperfect radiographic evidence."

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*Dr. E. E. Irons, Chicago, Jour. Nat. Dent. Assn., Nov., 1919.

There will be many cases where the patient's welfare will be better safeguarded if the dentist co-operates with the physician relative to the physical condition of the patient before he determines upon conservative or radical treatment. Too often the dentist is over conservative in the treatment of teeth, and will attempt to retain a pulpless tooth in a patient's mouth whose physical resistance will not tolerate it. No attempt should be made to save a tooth, if in so doing it destroys the health of the patient. The writer here wishes to take exception to the statement made by some physicians and a few dentists that a pulpless tooth acts as a foreign body in the jaws.

Many men in the profession believe that if the pericemental membrane is vital and if the canals have been sterilized and properly filled that the tooth in question may be retained for many years of usefulness, providing the resistance of the patient is normal.

The foundation upon which the treatment of pulpless teeth must stand is based upon three factors: first, the amount of pathologic involvement; second, the physical condition of the patient; third, the possibility of sterilizing and completely filling the root canals.

If all the evidence shows that the end of the root is not denuded of its pericemental membrane the case can be watched and a series of radiograms be taken at stated intervals and compared. The patient should be apprised of the fact that this particular tooth is under suspicion. Here again the general health of the patient must be considered and the technic of sterilizing and filling the root canals must be considered part of the chain of evidence which must govern our procedure.

If, however, a case presents of an alveolar abscess of long standing or a case of imperfectly filled root canals with granuloma, where all the evidence points to a non-vital pericemental membrane in the apical area, surgical procedure rather than dental therapy is indicated. At the present time there is no method or medicament that will revivify the pericemental apex. If this membrane be vital, the tooth is healthy; if it be diseased that portion should be eradicated. This is the point in treatment where materia medica should stop and where good surgery should begin.

The character of the surgical procedure may be root resection in favorable teeth and extraction of the tooth in unfavorable cases.

Again we approach the subject of diagnosis. What are to be considered favorable cases for root resection? It is a lamentable fact that many men are resorting to this operation as a short cut method of eradicating an alveolar abscess over a beautiful crown or bridge attachment without first removing the crown or bridgework and sterilizing and properly filling the root canals.

Thoma in his book on "Oral Abscesses" says "Apicoectomy is only successful if the root canal has been sterilized and properly filled previous to the operation. It is not sufficient simply to amputate the root where the old filling ends, but the root canals and dentinal tubules have to be sterilized or there will be reinfection from the tubules exposed where the root is cut. If it is not worth while to remove a crown and treat the root canal, the tooth should be extracted or there will be a recurrence and the patient is as badly off as before. It is not justifiable to leave a crown on a tooth because it is a masterpiece of art, if the foundation upon which it is built ruins the patient's health." This expresses the writer's views exactly. Too many times this operation is done with the view of saving a nice piece of bridgework when no attempt is made to eradicate the source of the infection. It should be a matter of routine not to do this operation unless the canals and tubuli have been sterilized and filled just previous to the operation. We are not doing good surgery when this is not done.

What are the most favorable teeth for the operation? For some time the writer has been limiting this operation to single-rooted teeth. This limitation has been made for two reasons: First, because of the accessibility of these teeth, a clean surgical operation can be performed. Second, we can be more sure of our sterilization and filling of the root canals. The possibilities of reduced silver * in the preparation of roots for resections seem to be encouraging.

The silver solution used for rapid reduction is made up as follows: Silver oxide is precipitated from a silver nitrate solution with KOH or KaoH. This is carefully washed to remove all impurities and

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*This is a modification of the Howe method for silver reduction advocated by Dr. W. G. Rickert, Nat. Dental Jr., Oct., 1919.

kept moist in a small amber-colored bottle. In this condition reduction is so slight that it has been kept for a long time without much change. If a small amount is insoluble in excess of ammonia, there has been too much reduction and the silver oxide should be freshly prepared. This is the stock solution and it will be seen that it is more desirable than the ammoniacal solution made from silver nitrate, because it is free from nitric acid and other impurities.

Now when we desire rapid reduction as for apicoectomy, the silver oxide is added to a drop or two of ammonium hydroxide to the point of saturation. This forms silver ammonium oxide. In this state the ammoniacal solution is easily reduced. The ease with which reduction takes place with this solution is so marked that even burnishing with a warm glass rod is sufficient to reduce to the lustrous metallic silver. There is one precaution that must be mentioned here. That is that after a few hours, fulminates of silver may be formed from the ammoniacal solutions, which are very explosive. Serious accidents are possible from even wet solutions. Only very small amounts of ammoniacal solutions should be made and the unused portion discarded immediately after treatment. After complete reduction there is no danger and only old ammoniacal solutions, especially after drying, are to be avoided.

The following technic is the one used preparatory to resection:— The canals are opened, using the rubber dam, and the silver solution is introduced to the very apex. Five or ten minutes are then allowed for penetration before the reducing agent is applied. This treatment is applied several times. The canals are then very carefully filled by packing with small pieces of gutta-percha points softened by gently heating.

The question of sterilizing and properly filling canals in multirooted teeth for the eradication of an infection has been a very doubtful procedure in the mind of the writer and in his opinion the patient's welfare will be better taken care of in these cases by extraction of the tooth followed by curettage of the bone.

It is possible in a few cases to resect the entire lingual root of an upper molar or the mesial or distal root of a lower molar and preserve the remainder of the tooth for further usefulness for a limited time. Such procedure, however, is usually only temporizing and if the patient is suffering from systemic disturbance the operation would under no circumstances be indicated.

Where the bone and pericemental membrane are diseased from the apex to the gingival margin of the gums the tooth should be extracted rather than try to save it by root resection. In no case should this operation be resorted to when the tissues are diseased beyond the apical third of the root of the tooth.

If this operation is to take its place in conservative dental practice, our diagnosis will play a very important role. Our whole success will depend upon whether our diagnosis has been correct. The modus operandi will avail nothing towards success of the operation if our diagnosis has been faulty.

The welfare of the patient should be the first consideration and a hasty diagnosis may lead to just simply an operation rather than a judicious successful treatment of the condition.

There are many men in both the dental and medical professions that are not yet aware of the significance of low-grade infections. A closer co-operation between medicine and dentistry will avail much in accomplishing the desired results—yet both doctor and dentist must be awake to the true situation of affairs. It will not avail the physician anything if he refers his patients to a dentist who is not awake to this serious situation. He should know who is who in dentistry and many times if he expects to get the desired results it will not be possible for him to co-operate with the patient's own dentist unless that dentist knows the situation. The same is true with the dentist. In many of these cases the patient's welfare will be better safeguarded if the dentist co-operates with the physician. He should know who is who in medicine, and if the patient's family physician does not fully recognize the importance of these conditions, then he is not doing the best that might be done for the patient in referring the patient to him for co-operation. This may sometimes result in an embarrassing situation, yet the time is here when both the dental and medical profession must be awakened to the serious situation of these low-grade infections. The time is here when the patient will not be referred to a dentist with the orders for a complete removal of all of the teeth, but will be referred to the dentist for advice and co-operation. When the time comes, that the doctor and dentist are working together for the best interest of their patients, then will be the time that both professions will justly receive the blessings of a grateful humanity.

DISCUSSION.

DR. FULTON RISDON.—I have listened with pleasure to the paper read by Dr. Lyon and congratulate him on his breadth of vision. I gather that he is asking us to view our patients as an entity, each part to be treated in regard to the whole, and not as many parts without any centre. In other words the Specialist should feel that he is a spoke in the great wheel necessary to improve the health of the patient. This means co-operation.

To-day, as never before, the medical profession is asking for help in the treatment of focal infection, but with the compliment comes increased responsibility. There is no doubt in my mind about the ability of the dental profession to give this advice in the near future, but at present is it not a fact that our knowledge along this big subject is limited and that we feel that more work must be done?

We can feel sure that the Rhinologist will give us all the support of which he is capable by investigating the tonsils, sinuses and mastoids. To-day a great controversy is being waged over the radical treatment of the tonsil and some suggest that many tonsils are being removed needlessly.

I believe that the Essayist feels that we should not be seized by all fads and fancies but that the dentist should review the literature and his own successes and failures in regard to root canal treatment. He should ask himself in what cases has this treatment been a success? This should aid him in selecting his cases for the future.

The author speaks of the resistance of a patient, and as a theory that is very useful, but what can be his standard of resistance in his healthy office patient? I believe in the final analysis, it is a mere theory and of little practical value for everyday office practice. My reason for feeling this way is that wholesale extraction has been recommended by the dentist and physician because of the general surmise that the resistance of this particular patient was low and with very little confirmatory evidence. To-day we have no positive guide as to the resistance of any patient except judgment.

As to the resection of the apex of an infected tooth, having a pus sack and where the peridental membrane is not lost for more than the apical third, the consensus of opinion is favorable, but as to the possibility of filling the root aseptically before resection, opinion is divided. Does it seem possible to have infection plus moisture at the apex of an upper central, where the forces of gravity, suction and capillary attraction can work and still be able to introduce a sterile root canal filling, whether silver oxide or any agent is used to seal the dental tubuli or apical end of a root. Why seal in infection?

The Essayist throughout his paper kept on a very broad plane, in fact little or no particular treatment was mentioned. He seems to feel that as a profession in this present crisis, we might bend, if not break, also, where the medical adviser suggests that radical methods should be adopted. All possible should be done to work together to obtain the best result, as both bodies have only one aim at heart, the general welfare of their patient. It may follow that the medical adviser, rightly or wrongly, is taking the broader view than the specialist, and if so time, along with conscientious work on the part of both bodies, will solve the problem.

DR. A. E. WEBSTER complimented the essayist on his very interesting paper and stated he felt it was necessary to first study the whole problem,—relating to the family history, the condition of the heart, kidneys, tonsils, sinuses, and mucous membrane of the mouth, before arriving at a definite conclusion. In closing, Dean Webster remarked that Dr. Lyons' paper was a most sane view of a very important subject.

DR. MCDONAGH continued the discussion by referring briefly to the X-ray films. He felt that radiographic findings are not sufficient to form a complete judgment at all times, but are a very great aid if they are used intelligently with other symptoms of the case.

DR. HUSBAND added some interesting facts relating to the importance of diet, as a causative factor in many low-grade infections. He was followed by Dr. McLean and Dr. Pearson, who entered into the discussion briefly.

DR. SNELL, on behalf of the Society, moved a hearty vote of thanks to Dr. Lyons for his most interesting address, which was seconded by Dr. Spaulding.

Tooth Decay and National Health*

HAROLD CLARK, D.D.S., TORONTO.

ONE of the most significant developments of recent years is the increased attention given by communities to the economic value of the health and well-being of their individuals. It is now recognized that a healthy, contented and happy workman means an efficient workman,—a workman who does more work and better work, and doesn't lose time through illness. Such a workman is a very positive national asset. A factory workman who lives in a rural suburb with his garden and plenty of fresh air about him is going to be a better workman than if he were a dweller in a city slum. Such companies as Cadbury's, Sunlight Soap and others have built and maintain model villages, or garden villages for their workmen. While deserving credit for a philanthropic undertaking they have simply been wise enough and big enough to make a good business investment. Experience has proved that the amount and character of the work done by the individual in these establishments are so much improved that the outlay in his behalf is more than returned.

The recent war will be followed by another struggle which may be without bloodshed and horror, but it will be none the less keen and its duration will be measured by generations and not by years. It will be the contest of nation with nation for mastery in the world's achievements in peace. Success will fall to those nations whose citizenship is marked by the highest degree of efficiency and the lowest percentage of defectives in their populations. In the barnyard, an unhealthy and useless animal is soon destroyed to make room for a better one. In human affairs we don't do this. We drag along with us our army of weaklings and degenerates, coddling them, doctoring them and keeping them alive, even allowing them to perpetuate and multiply their kind. Hillaire Belloc, as a war prophet, was about as successful as the average man on the street who read his papers. But in one thing he was most convincing. That was his frequent explanation of the handicap suffered by an army that had even a small percentage of troops of low standard. Infinitely better and more effective would be an army with its numbers reduced by the removal of its defectives. And so it is going to be with the nations. Is there any national problem so important as human degeneracy, its causes and prevention? The more the writer contemplates these things the deeper is his conviction that a great responsibility is lying at the door of the dentist. There are many causes of degeneracy, of course, but we are only awakening to the serious part played by a decayed tooth in the human wreckage we see about us.

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*An unpublished paper read before Hamilton Dental Society, January, 1919.

The raising, feeding, clothing, educating, and training of the individual from birth to maturity is really a very costly matter. I have seen it estimated at an average of $5,000 per person. Whoever may directly or indirectly bear the burden of this outlay it becomes a very real part of the nation's expense, and the individual is thereby an important national asset and the loss of his life or any diminution of his usefulness is as real a loss to the nation as the killing of a cow or the maiming of a horse is to the farmer. Communities are realizing this fact more and more and see that monies spent in safeguarding the life and the health of the citizens and maintaining their efficiency is a good business investment.

For a long time we have had free dispensaries and hospital service for those unable to pay for them, and many useful lives are saved to the community thereby.

Free dental clinics are gradually being instituted in the most progressive nations of the world. The physical suffering obviated by these clinics would alone justify their maintenance, but on economic grounds it is easy to justify the outlay involved. Prof. H. P. Pickerill, in his work on "The Prevention of Dental Caries and Oral Sepsis," makes an interesting calculation. In Great Britain, where over 90 p.c. of the population suffer from tooth decay, it is a very conservative estimate that the workman loses an average of, at least, one hour's work per annum per man from decayed teeth. Putting the value of that hour at the low figure of 3d. it means a loss to the nation in one year of £1,687,500, or over $7,000,000. But this is a very small part of the loss to the nation that is traceable either directly or indirectly to tooth trouble. A large portion of our population is ignorant of the value of dental services. Their children's teeth decay and are allowed to go without repair. Mastication soon becomes painful. Food is consequently swallowed without chewing. Indigestion results, followed by poor assimilation, lowered vitality, susceptibility to germ invasions and disease. In time these decayed teeth become abscessed teeth, and in this condition we have the greatest menace of all resulting from tooth decay. Anyone who has suffered from an acute abscess at the root of a tooth knows it is one of the most painful and distressing experiences known to human flesh. When the acute stage has passed there may be a long period of immunity to pain, but all the while the abscess, now chronic, is discharging pus into the system, carrying with it all sorts of poisons which express themselves in a multitude of maladies, the least of which are loss of energy, indigestion and gastritis, violent headache, rheumatism, &c. Children suffering from such tooth conditions are, both in the home and the school, irritable, dull, ill-natured, incorrigible and are classed as stupid, ill-behaved or even vicious. They go into life with a bad name as well as an evil nature and a large percentage of them, instead of being a national asset, become an actual charge on the community. Sometimes these chronic abscesses are so obscure that they can be detected only with the aid of the X-ray. I am again quoting Prof. Pickerill when I say that chronically abscessed teeth are responsible for a multitude of malignant diseases, tubercular glands, pernicious anaemias, cerebral disorders and general chronic debility. The report of The British Royal Commission on Physical Deterioration found that tooth decay was a most potent cause of physical degeneracy, and Sir Wm. Osler claimed that tooth decay is a greater cause of physical deterioration than alcohol.

While the brushing, cleaning and rinsing of the teeth are all well worth while, and the achievements of dentistry in repairing the ravages of tooth decay, restoring teeth to health and usefulness and replacing lost teeth with artificial substitutes are of great value to the individual and the community, is it not all very much like an elaborate system of "swatting" flies in an endeavor to deal with the pest instead of removing their breeding places? Why should we have tooth decay? It is so general that we take it for granted like changes in the weather or old age. Yet tooth decay is almost the exclusive possession of civilization. The aboriginal races, uninfluenced by civilized man in their mode of living are practically immune. The Maoris, the Igorots, the Eskimo have barely more than one or two per cent. of their population with any tooth decay, while England and Scotland have between 95 and 98 per cent., and from statistics that have been taken in many civilized countries it may be stated that upwards of 90 per cent. of the civilized world suffer from tooth decay. If all civilized mankind were generally susceptible we would suspect some physical degeneracy accompanying civilization; or if immunity on the one hand were always associated with a high degree of good health and bodily vigor, and susceptibility, on the other hand, only found in those of low vitality and poor health, we might naturally assume that they, immunity and susceptibility, were simply attributes or expressions of good or bad health. But every dentist knows that tooth decay seems to obey no rule. We see one individual with generally good health and yet with rampant tooth decay, while another with poor health will be practically immune. Individuals often seem to pass through periods of immunity and susceptibility. One person may have a filthy uncared-for mouth and yet his teeth be immune; another giving his teeth every care is constantly in the dentist's hands. We often see members of the same family display the extremes of immunity and susceptibility when we should expect similar heredity and similar environment to give similar conditions. It is this very seeming paradox that seizes the imagination and suggests that there must be some elusive factor or factors in the phenomena of tooth decay which when discovered and understood will explain the anomalous character of all these facts, and put it within the reach of all to attain practical immunity to tooth decay and all the ills that accompany and flow from it.

For nearly a century original research has been working on the problem, but not until about forty years ago was anything discovered that was taken seriously by the scientific world. About that time an American dentist in Berlin by the name of Miller gave out the results of his investigations. His deductions were very generally approved and accepted. Briefly they were as follows: Tooth decay is the result of the gradual solvent action of lactic acid upon the lime salts of the teeth, just as sulphuric acid will eat the lime out of a piece of marble. The lactic acid in the mouth is a by-product in the life of certain germs in the mouth, and these germs require a soil, or culture medium, of carbohydrate food in which to live and multiply. In other words, he stated, that these germs flourished on the debris of carbohydrate food about the teeth. This led to a campaign as wide as civilization of tooth cleaning and mouth sterilization. There are a thousand people using the tooth-brush now where one used it fifty years ago; and antiseptic mouth-washes and dentifrices are simply legion. While the results of this campaign have made it all well worth while, the discouraging fact remains that tooth-decay goes right on. Tooth brushes clean only certain portions of the tooth surface and the portions they cannot reach are generally the most vulnerable. Mouth-washes to be strong enough to really sterilize the mouth would also destroy the mucous membranes of the mouth.

Before proceeding any further, let us be sure that everyone understands what is meant by carbohydrate food. Even as school children we were all taught that the main elements of our food were the carbohydrates, hydrocarbons and the proteids. The first includes everything in the nature of starches and sugars; the second, the hydrocarbons, are made up of the fats and oils; while the proteids refer to meats or their equivalents: fish, poultry, eggs, cheese and the glutenous portions of the grains. Our subject confines us to a consideration of the carbohydrates, as they, at least indirectly, are the cause of tooth-decay. We say they include the starches and sugars. These two substances, although so unlike in their physical characteristics, are, from a chemical standpoint, nearly identical. In the digestion of starch the very first change that takes place is the conversion of the insoluble starch into a soluble sugar. Sugar is contained or developed in the tissues of many plants or vegetables such as sugar cane, beets, corn, parsnips, pears, oranges, apples, etc. Civilization, in the development of its scientific achievements has learned how to separate the sugar from the plants in which it grows, so that we can eat the sugar without having to eat the plant with it. We can also use the sugar to sweeten other vegetable foods that do not happen to have sugar in them. It is an interesting fact that we do not sweeten our proteids. We wouldn't care for sugar on our roast beef, or a fried egg, or a piece of cheese. Now, it doesn't require the knowledge of an experienced dentist to know that there must be some intimate relation between sugar eating and tooth decay. The most ignorant mother of children may often be heard to say that it is little wonder some child has "rotten teeth" because it eats so much sugar and candy. If it were starch, instead of sugar, that was under suspicion, the problem would be less of a mystery. Miller, of Berlin, told us that the lactic acid came from the fermentation of the carbohydrate debris about the teeth. Starchy substances have a tendency to form a pasty mass or film about the teeth and might easily be the seat of fermentation; but the sugary portion of the debris of our food is so soluble in the fluids of the mouth that it must be dissolved and swallowed long before fermentation could take place in it. So that the one element of our carbohydrates that we most suspect in the causation of tooth decay is removed from the mouth before the damage is done and thus an alibi would seem to be established for it. For many years, I was convinced that sugar must in some way react on the teeth after being swallowed. But how it did so I didn't know and so I had to mark time on the matter until I had the good fortune to meet Professor Ed. C. Kirk, of Pennsylvania University, another well known investigator. He was able to tell me that where there was an over-ingestion of carbohydrate food the system would digest it and use what it needed, and from the remainder a portion of the digested carbohydrate, in liquid form, would find its way into the circulation, and from it through the various mouth glands into the mouth. This substance has been proved to be a very fertile culture medium for these germs of fermentation. This partly clears up the mystery of the influence of sugar in tooth decay. It does come back into the mouth after swallowing. But it is the writer's conviction that the main culpability of sugar in the causation of tooth decay lies in quite another direction. It is indirect but none the less positive. Sugar is so attractive to the average human palate that it and foods made rich with it are eaten away beyond the normal prompting of hunger. An illustration will perhaps make this statement more clear. Imagine a hungry person with a meal of good meat and vegetables before him. Let him eat till he cannot be prevailed upon to take another cut of meat or another potato. Yet he will readily eat a helping of sweetened rice pudding and perhaps a second helping. Now, after eating his limit of meat and vegetables, if he were confronted with plain boiled rice he would have no desire for any of it, proving that the sweetened dessert is very commonly eaten not because of actual hunger but to gratify a desire that was due to the attractiveness of the sugar. There is little doubt that this fact suggests the real or main part played by sugar in the causation of tooth decay. The over-consumption of carbohydrate food results in the presence in the mouth of digested carbohydrate, which, in its turn, is a fertile culture medium for the germs of fermentation, and these, as explained before, are the proven cause of tooth decay. We are often asked how much carbohydrate food should be eaten. My answer to the question is that without the tempting influence of sugar in our food, the gratification of normal hunger would be an automatic "cut-off," as it were, that would prevent us from passing what might be called the "enough point." So that, speaking theoretically, we wouldn't load the system with any more carbohydrate than it needed and would use. The aboriginal races, uninfluenced by civilization, know nothing of sugar as such. Many of the vegetable substances they eat contain sugar, but they would have to eat impossible quantities to get any appreciable amount of sugar. For instance, one would have to eat beets to the full capacity of his stomach in order to have consumed about one and a half ounces of sugar. Many native races eat sugar cane and have relatively good teeth, and this is frequently quoted as an argument that cane sugar cannot be harmful for the teeth. It takes about twenty sticks of sugar cane to make one pound of sugar, and this means that one ordinary lump of sugar is the product of about two feet of cane. Tea and coffee drinkers, therefore, commonly consume in each cup enough sugar to be the equivalent of from two to six feet of cane. The savage encounters no such concentration of sugar as this, and he doesn't sweeten his other carbohydrates as most civilized people do.

Inasmuch as tooth decay is known to depend upon the amount of lactic acid in the mouth, and the amount of lactic acid depends upon the number of lactic acid producing germs in the mouth, and these germs, in their turn, depend upon the fertility of the soil they find in the mouth, it is an important matter to consider the fermentability of the various foods eaten; for the fermentability of a substance means simply its fertility for the germs of fermentation. A table of fermentabilities compiled by Prof. Pickerill of foods commonly eaten places chocolate at the very head of the list. In fact it is more than twenty times as fermentable as cane sugar, thus making the sweetened chocolate so common nowadays as probably the most harmful.

It is well known that after the large indulgences in sweetmeats during the Christmas festivities the physician is very busy with tonsillitis, grippe, quinsy and other ailments commonly known as colds. They are all due to germ proliferations and are probably subject to the same influences as tooth decay, i.e., an increased fertility of the fluids of the mouth to the germ or germs responsible for the ailment.

I again quote Prof. E. C. Kirk when I make the statement that an abnormal carbohydrate craving may be acquired just as surely as a cocain craving or a morphine craving. The girl who says, "I just must have some chocolates," is as truly a victim as any dope fiend. Another statement of Kirk's in this connection is interesting. After pointing out that alcohol is made from some form of sugar and may be classed among the carbohydrates, he says that the candy-fiend's craving is so much more readily satisfied with alcohol than with candy, or to use a commonplace expression, ""it goes to the spot" so readily that the preference is easily established. He states that in all cases where he has investigated he has found women who were alcoholic victims were previously candy-fiends. It is well known that reformed drunkards usually eat enormous quantities of sugar to keep the desire for alcohol within bounds. In many institutions that set out to cure alcoholism they give the patient molasses when they remove his alcohol.

The more one studies and observes the facts bearing on sugar consumption the more he is driven to the conviction that the discovery of the process of separating sugar from the plant in which it grows may not be an unmixed blessing to civilization. Statistics show that England and Scotland have perhaps the worst teeth in the world. Statistics also show that England and Scotland consume more sugar per capita than any other country. The United Kingdom consumes annually 3,600,000,000 pounds of sugar.

In a recent address before the Forsyth Institute in Boston, Dr. Harvey Wiley makes a very emphatic statement about sugar. Referring to war restriction on the use of sugar, he says: "The sugar shortage is one of the greatest blessings that ever happened to the people of this country, and if it will have done nothing better than to teach us that we can do without sugar, the war will have paid for itself in the general health of our people, especially of the teeth. Sugar is the enemy of the teeth, and more teeth have been destroyed in this country by sugar than by all other means combined. The worst enemy of the child is usually the mother, in spite of the old proverb that a boy's best friend is his mother. The mother who gratifies the wishes of her children when they come to her for sweets is the enemy of those children. A child would never come for sweets if not taught to have them. People in this country begin to feed their children sugar when they are five years old. Sugar is the curse of this country. A great many so-called preachers of nutrition say, 'Give the child plenty of sugar, all the sugar he wants.' The very thing he should not have! The child should have just the amount of sugar present in milk and other foods and no more. Nature provides sugar in foods and it is all the child should have. I would like to be food director for a little while. I would close every candy factory in the country, every single one, not for the duration of the war but forever afterwards, and pass a law in every state making it a penitentiary offence to give any child sugar before it is fifteen years of age. Even with nothing else it would mean a fifty per cent. improvement in the young people's teeth and health in this country." Harvey Wiley is recognized as a leading authority in matters of diet and food values and it is significant to have him make the above statement.

For a long time after Miller's theory was accepted the progress towards a further clearing up of the mysteries of dental caries seemed to mark time. During the past few years, however, several investigators have made very significant contributions to the subject. J. Sim Wallace has written several small works on diet for the prevention of tooth decay. The dominant note in all his books is the paramount importance of a diet requiring heavy mastication. He makes an interesting observation concerning the evolution of our teeth and of our digestive organs. He points out that although our civilization stretches back across many generations, the countless generations that preceded civilization make its period seem negligible. This earlier and age-long period he terms the "precibicultural era," the era prior to the cultivation of food, when mankind lived on food that was found ready to hand, just as the animals about him did. The character of his food was such that he had to eat a certain bulk of it before he would have in his stomach enough assimilable nutriment to carry him to his next meal. In an evolutionary sense, this probably determined the capacity of the stomach we have inherited from him; and we know that it has to have a certain degree of distension before it will function well. The tendency of our modern food is towards concentration; therefore a stomachful of the usual modern food contains much more nutriment than the same quantity of our ancestor's food, and therefore more than is needed even if we were as active as primitive man was. The character of this primitive food would obviously require much heavier mastication than modern food. Important inferences may be drawn from these facts. The efforts of civilization to improve the order of the past seems to have resulted in disorder. This disorder commences in the diet of infancy. Even in some aboriginal races of to-day we observe that they have neither cows nor goats to give them milk, and the weaned infant has to begin masticating food while the civilized mother feeds her child milk-soaked food long after it is weaned although it is provided with an upper and nether millstone spoiling for something to do. These teeth weren't given the two-year-old child as an ornament, nor were they placed there before they were needed. It would seem that some physicians regard the stomach as the beginning of the alimentary system, and the mouth as simply a hopper through which the food is conveyed to the stomach. They prescribe all sorts of pap food for children long after they have their deciduous teeth with the idea, apparently, of filling the stomach with nourishment that is easily digested. Grave consequences probably follow this first departure from the order of things established for us in the precibicultural era. Heavy mastication gives the aboriginal child ample development of jaw and tongue to provide room for the on-coming permanent teeth. Such a diet would undoubtedly minimize or even do away with difficult or pathological dentition and the frequency of crowded and mal-posed teeth.

A great amount of laboratory work has yet to be done by our investigators before we can dogmatize on many matters of diet in relation to tooth decay, but sufficient has been learned already to enable us to correct many errors that have crept in and become established with our civilization. Many have the idea that a correct diet involves a Spartan simplicity that would remove all interest and zest from the table, but quite the reverse is the truth. One might go from a bill-of-fare that was physiologically wrong to one that was quite correct and not be aware that he was being subjected to a diet. As a matter of fact all laboratory work on the subject has demonstrated that it is of paramount importance that our food should be of such character as to cause an ample flow of the oral fluids,—literally, it should make one's mouth water.

In conclusion, I might say the indications are that in the research work on behalf of the teeth, the mysteries surrounding many obscure ailments are being solved. Sir William Osler said a short time ago that the next great thing in the matter of public health was coming from the dentist. If the cause of the prevalence of tooth decay among civilized people can be fully ascertained, and the remedy is not too difficult or distasteful in its application, there can be no doubt that the general uplift to physical efficiency would be very great and important.

After the grim struggle that has devastated Europe and paralyzed the world there will begin another international struggle for the possession of the mastery of the world in the arts and achievements of peace and the victory will go to the nations having the highest degree of physical and mental efficiency and moral rectitude. Any nation that allows itself to drag along debilitating and degenerating customs or habits that are capable of correction, that nation cannot hope to keep in the forefront of the great race that is ahead of all nations.

Dr. Roach's Post Graduate Course in Hamilton

THE splendid efforts of the Hamilton Dental Society in the way of Post Graduate Studies is becoming a matter of particular pride for the Profession of Ontario. This enterprising group of men has already anticipated the rest of the profession in bringing, for the first time in Canada, to their city for a week's Post Graduate work, two of the outstanding figures of the American Dental Profession. During the summer of 1919, Dr. Rupert Hall gave a successful Post Graduate Course in Hamilton, this being Dr. Hall's first appearance in Canada.

Just recently, the Hamilton Dental Society availed itself of the splendid privileges of another of America's outstanding dentists, to wit, Dr. F. E. Roach, of Chicago, who, during the week beginning February the 2nd, gave a remarkably successful Post Graduate Course to the members of this progressive Society.

To those who had the privilege of listening to Dr. Roach, in either Hamilton, Toronto or London, or in other places, for one, two or three lectures, the week of Post Graduate instruction was a revelation, inasmuch as these lectures, remarkably fine though they were, conveyed a comparatively small percentage of the actual information to be obtained in Dr. Roach's Course on the subject of "Partial Dentures." The sessions extended over morning, afternoon and some evenings of the entire week and Dr. Roach, handicapped as he was somewhat in being without a Laboratory Assistant, kept his audience in constant state of concentrated attention and delighted interest, as the details of his remarkably fine technic unfolded themselves.

The greater part of the time was given up to a consideration of that branch of "Partial Dentures" and "Removable Bridgework" indicated for the more or less short space or succession of short spaces following the loss of one, two and sometimes three teeth. This naturally involves the use of the various types of cast clasp and also special interlocking retaining devices. Of these cast clasps, Dr. Roach places emphasis upon these particulars, mainly the mesio-distal grip clasp, the buccal lingual grip clasp and the embrasure cast clasp. In the demonstration of each of these types of clasps, patients were utilized from the audience, demonstrating the entire technic from the beginning of the impression to the final impression and adjustment of the case, the entire operation, both laboratory and chairside, having been executed in the presence of the class. In addition to this, an extension case was also constructed involving the use of a double cast clasp with an embrasure buccal extension.

A particular feature of interest was the accurate and dependable casting technic, as demonstrated by Dr. Roach; briefly, this consisted of use of specially hard cast clasp investment material, (Weinstein's), the expression of the wax immediately after the crystallization of the investment had taken place, and the gradual and slow expulsion of moisture from the flask, casting into a matrix almost cold. The casting was accomplished on a remarkable casting device, the product of Dr. Roach's genius. A centrifugal arrangement with a counter-balanced horizontal throw, which technic and appliance, in the mind of the writer, represents the last word in casting technic for Prosthetic cases.

An Oxyacetylene Torch was used for the fusion of the platinum palladium alloys used (Weinstein's series) for casting in which, as demonstrated by Dr. Roach, in neutral flame free from the carbon which operates so injuriously upon these platinum palladium alloys, was readily secured.

Another feature of absorbing interest was the system used by Dr. Roach in securing a saddle in his assemblies under pressure. Briefly, this consisted of the construction of entire skeleton work including saddles, apart from the direct retainers themselves, the introduction into the mouth of the completed direct retainers and the skeleton work, separately from one another, and the ingenious means adopted by Dr. Roach by small extensions from the impression tray and other methods, for holding the saddles under whatever pressure desired while the assistant introduced a small amount of plaster (to secure this relation) into the patient's mouth. For this reason, Dr. Roach prefers all-metal construction, because it is not possible to use this system of saddles under pressure, with vulcanizing restoration.

The members of the class were as follows:

Drs. Amos, Wilson, Manning, Laning, Gray, Burnett, Morrow, A. Johnston, Moore, Robertson, Johnston, Tindale, Williamson, Kelly, Stewart; Messrs. McDonald, Von Gunten; Drs. Locheed, Thompson, Clark, Hill and Clappison.

In addition to the above members, Dr. W. E. Cummer, of Toronto, enjoyed the privilege of the hospitality of this Society and of studying with the members of the Class under Dr. Roach's tuition.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

Hypnotic Suggestion in Relation to Dental Practice.

As you have watched the results obtained by professional hypnotists the thought no doubt has continually been: Why could not this skill be used in the realm of medicine and dentistry? If you are interested in this subject, a perusal of Dr. Betts Taplin's paper, published in the January number of *The Dental Record*, will prove profitable.

Mesmeric or hypnotic healing is not a new thing. It was practised by the ancient Egyptians and even before that by primitive man. These early people had a conviction that their various deities could destroy disease and pestilence simply by means of some sort of power which was a part of their very being and which they were able to breathe out, as it were, upon those seeking aid. There was an implied magnetic personality. So it came about that these primitive people sought to gain the favor of the deity by means of gifts and sacrifices. In later times history goes to show that many of the great religious leaders exercised this power of healing. The Faith Healer of recent times believed his faith sufficient to cure him and the present day Christian Scientist will tell you that his belief will cure him of all his ills. If we concentrate our attention upon any part of the body it is possible to produce a sensation in that part. The influence that the mind exercises over the bodily functions has often been demonstrated in a surprising way in medical practice. It has been shown that the mind can be so influential by suggestion as to modify the functions or nutrition of the body. Examples of this are given with those who put a mustard plaster on the wrist in order to stop a toothache or carry a potato in the pocket so as to ward off neuralgia, etc. That these devices have given benefit there can be no doubt, but it was due solely to the mental attitude of the patients themselves.

The annual pilgrimages of sick people to shrines are examples of what may be accomplished by engendering belief in the mind of the sick pilgrim. In this way cures may be effected. Christian Science today owes its efficiency to this very fact. The application of this principle to medicine was first suggested by Mesmer, a Viennese physician. His methods were strongly condemned. This physician, however, gathered about him in 1778 a group of disciples to whom was given the name of Mesmerists. The French Revolution checked their efforts for a time. Later on a number of British physicians and surgeons took up the study and showed how it might be successfully applied in treating disease. Again the public condemned it. The clergy was especially antagonistic. James Braid, a Scotch surgeon, published in 1843 his first work on mesmerism—"Neurypnology, or the Rationale of Nervous Sleep"—in which he showed conclusively that the phenomena of mesmerism were subjective in origin, or due to a changed mental state produced in the subjects themselves, and not to any influence or mysterious emanation passing from the operator to the person dealt with. He therefore proposed that the condition should be termed Hypnotic.

In 1891 the British Medical Asssociation appointed a committee of eminent physicians to investigate the nature and phenomena of hypnotism and their report stated that they were satisfied as to the genuineness of the hypnotic state. They found that the term "Hypnotism" was somewhat misleading, inasmuch as sleep in the ordinary sense was not always present and that they were of the opinion that as a therapeutic agent hypnotism is frequently effective in relieving pain.

Now, as to its use in dentistry. Let us quote Dr. Taplin in this regard. He says: "The popular idea of hypnotism is that a person is put to deep sleep and that he knows nothing that is going on. That does not follow at all. I should think that quite eighty per cent. of my subjects have heard all I have said to them; heard every word. They simply sit in my easy chair; they pass into a comfortable rest. My suggestions then tell. Supposing it were a case of asthma with very bad breathing. If I tell him: 'Your breathing is getting easier. You take a deep breath from the base of the lungs.' That man is breathing perfectly, quietly, in a quarter of an hour. And this is not only when he is in my chair, but it does not come back. Supposing a person is going to have a tooth out. He is sitting in the chair perfectly comfortable. I rub his jaw gently and say: 'That gum is getting quite numb, as if you have had cocaine in it!' I go on for about five minutes. 'It is getting more and more numb!' I say. 'It feels quite dead!' I go on saying, 'It is quite numb—numb; you cannot feel when it is touched!' I say, 'Now, when you go to your dentist to-morrow, when you sit in his chair, that numbness will come back and it will not hurt you a bit. What is more, you will not mind going a bit. You will not feel nervous!' This is actually what happens."

Dr. Taplin furnishes a number of actual cases coming under his care where the power of suggestion has worked remarkably well when painful operations have had to be performed. In concluding his excellent paper, the author observes that everybody is not fitted for this psycho-therapeutic work, because it does require a certain amount of personality or something of that kind. But there are a large number of us who can do it. An absolutely quiet room is required, not even a ticking clock should be heard. Get the patients to go loose, to relax their muscles. Ask them to think of sleep. Close their eyes and ask them to think of sleep. Open them again and say, "You will get more sleepy!" Then close them again and say, "Next time you will be still more comfortable and sleepy. Think of rest and never mind what I say!"

It may take time to get results, but the effort will be amply repaid.

Some of the best works on this subject are: Tuckey—Treatment by Hypnotism and Suggestion; Bramwell—Hypnotism, its History, Practice and Theory; Felkin—Hypnotism or Psycho-Therapeutics.

Group Photograph of members of Dr. Roach's Post Graduate Course held in Hamilton during first week of February, 1920

For Erosion.—A paste of milk of magnesia and prepared chalk, applied around the necks of the teeth before retiring, will remain longer than any preparation yet tried. Spread on a piece of thin muslin and placed under the lip at night, will be found efficient in very wet mouths.

Home and School

Devoted to the interests of Dental Health in the Homes and Schools of the Community

This Department is Edited by
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Provincial Dental Officer, Department of Education, Ontario

THAT the modern educationalist appreciates the importance of the school child having a healthy, properly nourished and well developed body was conclusively proven at the meetings of the Ontario Educational Association held at the Toronto University during the Easter week. In the general meetings and at almost every section the subject of school health was discussed and the consensus of opinion seemed to indicate that too little attention was being given to this most important branch of education. The different speakers expressed the opinion that larger school grounds were needed so that the children might have more room for play and health-giving exercise, that better and more sanitary school houses should be erected and that more suitable equipment should be provided. They deplored the fact that more attention had not been given to health education and that bodily development as brought about by physical culture had to such a large extent been neglected. One inspector expressed the opinion that more than fifty per cent. of the school time should be spent in health education. Medical and dental inspection received the approval of all, the general view being that the Government should make a supreme effort to have permanent and efficient systems of medical and dental inspection and treatment established in all parts of the province. In discussing the question of a dental service before the "Hygiene and Public Health Section," Major Munn, one of the members of the Toronto school medical staff, made the significant statement "that in his opinion, the diseased and neglected mouth was a greater menace to the health of school children than all other defects," emphasizing the fact that so many boys and girls were the victims of this alarming condition; he made a strong plea that more attention be given the deciduous teeth, pointing out the dangers occasioned by their neglect. He was followed by Dr. John Noble, another physician and chairman of the Toronto Board of Education, who expressed similar views and urged the necessity of having the teachers better informed in regard to health matters. All the speakers were loud in their praise of the self-sacrificing and public spirited action of the dental profession in giving their time without fee to make the initial survey and expressed the hope that the advantage thus gained would be followed up by energetic action on the part of the Department of Education.

On the Tuesday evening of the convention, the public school inspectors of the province were the guests of the Oral Hygiene Committee of the Ontario Dental Association, at a banquet held at the King Edward Hotel. Dr. Eaton, the chairman of the committee, in a few well chosen words, thanked the inspectors for their co-operation and help in connection with the oral health movement; he informed them that arrangements were being made to have health articles appear regularly in over two hundred of the Ontario newspapers and also to present the claims for a school dental service to Boards of Trade, Trades and Labor Councils, Church Conferences, Women's Organizations and the different welfare associations, urging them to take such action as would in their opinion bring about this consummation so urgently needed. The Provincial Dental Officer outlined the work accomplished thus far and urged the public school inspectors to do their utmost to persuade the local municipal authorities to establish permanent systems of dental inspection, emphasizing the fact that delay and procrastination meant sickness and death to hundreds of the brightest and best boys and girls in our province. Dr. Wallace Seccombe showed a number of lantern slides which, in a very clear and illuminating manner, set forth the great value of preventive dentistry and demonstrated how effectively oral health could be taught to the school children and general public. He pointed out that these slides had been presented to the Department of Education and could be secured by any inspector who sent in a request to the Minister. Mr. Mulloy, the president of the inspectors' section, expressed the pleasure of his colleagues and himself in being privileged to co-operate in an activity that meant so much to the children under their supervision and stated that the dentists of the province could be assured of their continued help and assistance. A number of other inspectors spoke; they expressed the hope that in the near future the Provincial Department would be so increased that a dental officer might be sent out by the Government, to give public addresses and to accompany them as they laid before the municipal authorities the need for a school dental service. They stated that they did not feel competent to give the detailed information which the local authorities naturally desired to receive before launching upon such an enterprise and that if someone could be sent by the Department to assist them, more rapid progress could be made. A resolution embodying these views was passed at the regular meeting of the Inspectors' section and sent to the Minister of Education.

The Middle of the Road

HOW easy it is in life to wander off into the hedges and ditches and to stray from the beaten path; what a difficult thing to stick to the middle of the road. We cannot all travel a perfectly straight path owing to the diversities and distractions of life, but we can keep more nearly in line of our manifest duty than most of us do. It is human nature to constantly fly off at a tangent from the main purpose of life. We are not content to plod along on the straight and narrow way, but like cattle, when driven on the highway, we are forever exploring the fence corners and nosing in forbidden nooks. The novel, the strange, the unusual appeal to us, and divert us from the chief goal toward which all of our energies should be directed.

It seems so difficult for us to learn the lesson that in order to reach a given point it is always best to take the most direct route toward it, or at least the best beaten path. It is our love of diversion which distracts us and sends us into the by-ways. Some of this seems necessary and proper. In order to put zest into life we must have a certain amount of diversion. The dull routine of existence palls on the senses and makes us sluggish. It is said that variety is the spice of life, and yet too much spice is not good for anyone. Neither is too much diversion. If we season too highly our experiences with side issues we detract from the solid essentials of life, and get off the main beaten track.

If a man sets himself seriously to the accomplishment of a given purpose in life, and then keeps resolutely to the middle of the road leading to that purpose, there is hardly any set of circumstances that can prevent him from reaching his goal. But if this same man—wishing ever so fervently to accomplish his end—permits himself to be continually diverted by ulterior issues, he will never attain his purpose.

Constancy of aim is the keynote of achievement in most of the activities of life—moral as well as material. Mere goodness is not all, though goodness is one of the chief assets in shaping any career.

The first thing for every man to do is to make certain that he is on the right road, and when this is definitely determined, he should resolutely keep in the middle of that road and follow it to its logical terminus. In no way else shall he be assured of reaching his ultimate object.

I have watched many men and with much interest. I have seen some of them start out in the most brilliant way and with the utmost promise, only to fail lamentably in the end merely through being deflected from their chart by the magnetism of counter-attractions. It is so hard to be constant—it is so easy to be diverted. And I have seen other men who were not brilliant, men of less natural endowment, who have achieved success solely because they had constancy of purpose and the resolve to remain in the middle of the road.

And when one thinks of it, most roads are sufficiently winding and have ample change of scene for all legitimate entertainment if only we make the most of them as we pass along. No road is really dull. It is we who become dull, because we do not make note of all the wondrous phenomena laid out before our eyes. Thoreau's environment was narrow, or would have been narrow to most men, and yet what a world of interest he dug out of it. His country roads were never dull to him, no matter how many times he travelled the same way.

We cannot all be Thoreaus, because we lack his vision, but we can all aim to get the most out of our particular niche in life by observing the beauties that are spread along the wayside of our existence, and we can see these beauties more surely and more safely if we remain in the middle of the road, and look at both sides as we journey on.

C. N. Johnson

Toronto Dental Society

THE officers of the Toronto Dental Society for season 1920-21 have been elected as follows:

Past President—R. D. Thornton.
President—W. H. Coon.
First Vice-President—H. A. McKim.
Second Vice-President—A. C. Pye.
Secretary—H. H. Armstrong.
Treasurer—T. E. C. Butler.
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ORAL HEALTH

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EDITORIAL

The Legal Field of Dentistry

THE legal field of Dentistry is an important question—more important to-day than at any period in the history of our profession. During the earlier years of dentistry, the dentist confined his knowledge and the scope of his operations strictly within the oral cavity; but year after year the field has widened until now the dentist and the physician are so interlocked in their interests and inquiries, as to make it difficult to determine where the legal field of the one ends and the other begins. Indeed, the legal definition of dentistry is difficult to formulate. May we venture the following, which is not altogether original, nor yet ideal, but which we think covers the field fairly well:

"A legally qualified dentist, besides having the care of the teeth and oral cavity when sound and healthy, is entitled in his practice to diagnose and treat any of the lesions of the oral cavity, teeth, gums and maxillary bones; to correct fractures and all malpositions of the human jaws and teeth; to supply substitutes for lost tooth tissue and adjacent parts; to administer anesthetics, general and local; to administer or prescribe such remedies, (medicinal or otherwise), as shall be needed to assist him in the treatment of dental and oral diseases, and the maintenance of the mouth in a condition of health."

The point where the dentist of to-day is most likely to get beyond his legal depth, and infringe upon the domain of the general physician, is in the matter of "prescribing such remedies, (medicinal or otherwise), as shall be necessary in the treatment of dental and oral diseases, and the maintenance of the mouth in a condition of health." There is no doubt, however, that in following such a line of practice, if he is careful to confine himself to the prescribing of such specified remedies, he is legally and ethically on proper ground. As a matter of fact, the dentist is in duty bound to prescribe such internal remedies, and give such advice, as shall in his judgment assist him in the treatment of oral lesions. For example, he should, where indicated, give advice as to the proper diet; he should when necessary prescribe proper internal remedies in a case of excessive hemorrhage after extraction, or in an acute case of pericementitis, etc., etc., —it being understood, however, that such advice and prescribing are for the definite purpose of retaining or restoring the oral cavity to a healthy condition. Beyond this he is not legally entitled to go.

Some years ago an able and prominent Canadian jurist, the Hon. David Mills, was asked to give his opinion on this important matter, for the guidance of the dental profession. We quote it here in full:

"A Doctor of Dentistry may practise medicine in so far as his medical treatment is incidental to his profession as a dentist. In this respect he stands in the same relation as a surgeon who is entitled to practise medicine in so far as his medical treatment is called for on account of a surgical case. Thus the dentist may find that the infection of the teeth is due to a constitutional condition of his patient, and would thus be entitled to treat his patient medically to relieve pain. If all the teeth appear sound, he must consider whether his duties are not to treat the case constitutionally by the use of medicine, rather than surgically by the forceps. He is, as far as the treatment of the teeth is concerned, a mechanic, a surgeon and a physician, and the responsibility rests on him in every case to decide in what capacity he must act."

This opinion is quoted expressly for the purpose of drawing attention to the danger that lurks in the wording of it. If the legal mind that formulated this opinion had possessed the same knowledge of dentistry as of law, the phraseology would doubtless have been more clearly apprehended by the average Dentist. In this opinion the jurist would seem to have forgotten, for the time being, that the general surgeon is also a graduate in medicine, and the dental surgeon is not necessarily so. We might be lead to conclude from this opinion that the Dentist, upon discovering symptoms in the oral cavity of a serious lesion of the kidneys, for instance, would be equally justified in turning his attention to those organs, make his diagnosis and prescribe the necessary treatment. It is needless to say that the dental practitioner is neither justified by law nor by his training to practise upon such lines.

In all cases where the Dentist finds serious systemic complications relating to either the diagnosis or treatment of oral conditions, the family physician should be called in consultation, that the patient may be given advantage of the best possible advice and treatment.

There is no doubt that the work of the dentist and the physician will, as time goes on, become more and more interwoven. The wise and skilful dentist, who has the care of his patient at heart, will run little danger of trespassing on the domain of the general practitioner, while at the same time doing full justice to his professional qualifications and the powers conferred upon him as a dental surgeon.

Captain J. G. O'Neill Before Kiwanis Club

CAPTAIN J. G. O'NEILL, upon his return from overseas, was the guest of honor of the Kiwanis Club of Port Arthur. Preventive Dentistry was the subject of Captain O'Neill's address, and he emphasized the importance of the education of the child in the care of the teeth. He said that the time was not far distant when the dental problems of all children should be made a public health measure under the federal authorities. Especially true was it in dentistry, as in all medicine that an ounce of prevention was worth a pound of cure.

PERFECT SET OF TEETH A RARITY.

The speaker said that it was very rare to find an adult with an absolutely normal or perfect set of teeth. Dr. O'Neill showed that dental troubles arose from two causes, the infections which occurred about the roots of dead teeth, and infections from pyorrhea. Preventive dentistry proper was the extraction of all teeth which were diseased or suspected. If it were possible to save the nerves of all the teeth, if it were possible to keep the tissues of the mouth surrounding the teeth in health, dentistry would be able to work in such a way that the mouth would not be a menace to health. The tissues could only be preserved by oral hygiene.

EDUCATE THE CHILDREN.

Children should be taught not merely to clean the teeth, but also to keep the teeth and mouth in good health, by cleaning and polishing the teeth in such a way that no debris nor anything that might cause fermentation should be left in the mouth.

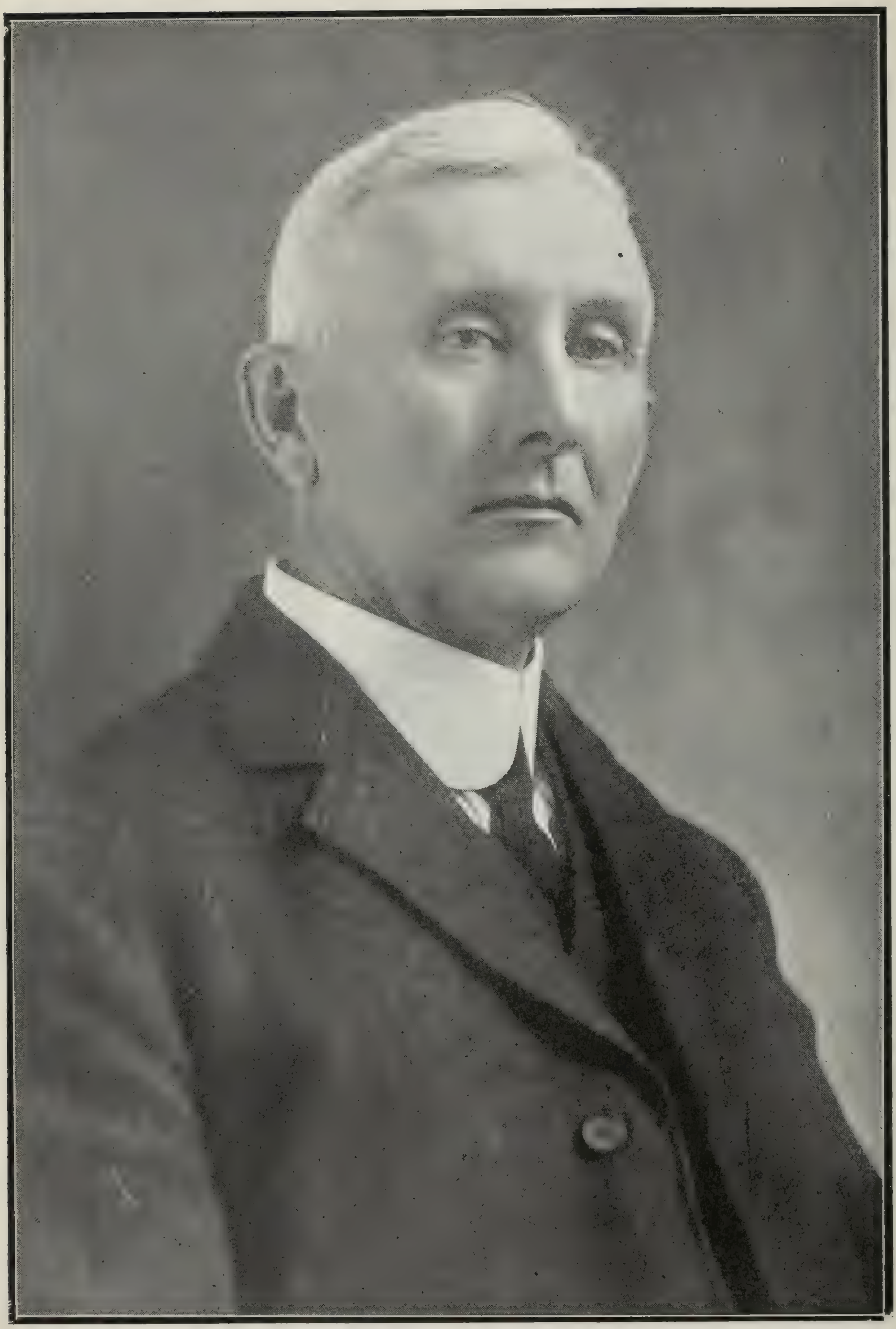
Dr. O'Neill said that parents should see to it that children were sent to the dentist regularly. That was why the local dental association was anxious to have the school clinics, not from any selfish reason, but purely from humanitarian motives.

Education *and* Reconstruction

EDUCATION in its broadest sense, has a vitally important part to play during the pending period of world reconstruction.

¶ *The Guardian* asks whether this old world is just wildly running amuck in these strange days of disturbance and unrest, and answers the question in the negative. To quote: "Notwithstanding the surface appearances of the time, there never was a day in human history when the race as a whole had as sincere and as honest a longing for justice and righteousness and equality, and all those other fine things of which the best of men have always dreamed."

¶ It will be the part of Education to not only teach facts, but principles, and to lead the rising generation to an appreciation of what true Christian democracy really means.



THE HONORABLE R. H. GRANT
Minister of Education Province of Ontario.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, MAY, 1920 No. 5

Pulps and Pulpless Teeth*

ELMER S. BEST, D.D.S., MINNEAPOLIS.

THERE was once an architect who decided to build a house for himself. He spent considerable time on his plans, which when finished, were given to his contractor with these instructions, "I am leaving the country for a year; during my absence you will build my house just as I have planned it." The builder looked at the plans and replied, "I would suggest one addition." He was immediately interrupted by the architect who again instructed him to build it as he planned, without any changes. When he returned he found his house finished without any stairway. He had forgotten to provide any.

You may wonder what this has to do with the subject of this paper. I will tell you. It displays the same lack of foresight that some of our professional co-laborers show when, with a wave of the hand, they dismiss this subject and say, "100 per cent. vitality, nothing but extraction, etc., ad infinitum," and then with an air of finality, close the discussion. I do not take issue with what they say, but there are a good many valuable things they do not say. Their foresight does not work as efficiently as their hind-sight and in many instances they work the latter overtime.

The subject of this paper is threefold:

First, to give a method of making oral examination particularly with reference to pulpless teeth.

Second, to offer suggestions that will act as a guide in deciding what to do when confronted with certain problems relative to pulpless teeth.

Third, to present for your consideration, a system that will prevent in a large measure any necessity for pulp removal. The outlook for the future is bright. It is optimistic, it is practical.

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* Read before the Toronto Dental Society, November, 1919.

The relation that physician, dentist and patient bear to each other on this subject apparently differs in various parts of the country when it comes to a consideration of certain oral conditions. One thing they all seem to agree on, however, and that is, they are all sick of "treating teeth." The patient is sick as a result of it, the dentist is sick with his results and the physician attributes much if not most sickness to it. It can be safely said that at least all agree on one conclusion, that the old-fashioned "treating teeth" has now been relegated to the dentist who wishes to continue his practice as in years gone by, totally oblivious to the progress that has been made in dentistry. There will always be a certain percentage of people who demand this type of service, so these men will be kept quite busy.

One of the rather unpleasant conditions which has arisen from the work done in mouth infection has been a lack of co-operation between the physician and dentist in many cases. In the early years of our profession, dentists did a large amount of extractions. Then Riggs introduced the first treatment for Riggs' disease or so-called pyorrhea alveolaris, and many teeth heretofore extracted were now saved. Until the introduction of arsenic for devitalization and cocaine for pressure anaesthesia, most aching teeth were extracted. The use of these two agents also caused many teeth to be saved that otherwise would have been extracted. All these discoveries had the effect of stimulating in the minds of dentists, a desire to save teeth instead of extracting them.

It had become a matter of pride with dentists that they could retain for their patients, their own natural teeeth. It was the general feeling among the profession that the old era of extraction and artificial teeth was passing and that patients could now be spared such ordeals by means of the perfection of operations which had required years of development. True, we retained their teeth, but in accomplishing this we made many mistakes and overlooked some mighty fundamental principles. The work of the tooth brush and other members of its family, instead of being controlled by the dentist, was treated almost with indifference, and the valuable help which could be gained from this source was lost. We have learned what a patient trained in Oral Prophylaxis can do.

While the presence of so much root end infection is not to be considered justifiable, yet it must be remembered that most of the operations causing it have been done without the X-Ray to examine conditions, and that the dentist was not aware of the existence of such a state of affairs. He worked in a great measure in the dark, but I am not unmindful of the fact that dentistry is not the only profession where serious mistakes have been made. It is well for dentists to not lose sight of this fact.

For the physician to whom patients naturally come in case symptoms of focal infection make their appearance, the removal of infected teeth has grown to be a means of clearing up many cases. As a result, it becomes quite common practice for physicians to request the removal of great numbers of teeth. Your Essayist has discovered upon investigation, however, that most of the stories in circulation regarding the unwarranted removal of teeth at the request of the physician have been greatly exaggerated if not unfounded. It has been found that our medical confreres are not unmindful of the value of the natural teeth if they are free from pathology.

However, it must be admitted that in some instances a great deal of harm has been done by physicians taking charge of cases and superintending the examination and diagnosis and treatment of mouth conditions relative to pulpless teeth. In justice to all concerned, it must be admitted that the attitude of some dentists in refusing to recognize pronounced pathology and have it removed, has, in a large measure, justified the action of the physician, and in the ultimate, the patients have been better off losing a few valuable but uninfected teeth than they would have been had none of the teeth been removed. However, such conditions have in the main been changed and it is now no longer necessary for the physician to feel that he must extend his field to include part of the work of the dentist in order to protect the patient.

Permit me to draw your attention to one interesting condition. I will eliminate any possibility of being accused of imputing the motives of any practitioner by stating that it is my belief that most diagnostic work in dentistry is the result of a conscientious desire to do the thing indicated. But we all know that if we were at all influenced by a desire to add to our practice, to adopt a policy of very extensive extraction would mean a great increase in the volume of bridge work being done. Further, if a man wishes to sacrifice any or all of such an increase, he can do so by the amount of root canal work he does and the number of pulpless teeth he saves. In the former decision he floats with the current in every way. In the latter, he rows up stream, many times against the strongest possible current. It is not necessary to tell you about the fees you receive for your root canal work. You know all about it.

When any of us feel a tendency to criticize those who still hold out for a moderate amount of pulp canal work controlled by a proper conception of pathology, let us not forget that these men have much to gain, should they suddenly let down the bars and go into the "oral surgery end of it," which, in most instances, is a nom de plume for extracting teeth.

There are at present in the dental profession, men who are keenly alive to the possibilities and significance of infection in and around certain types of teeth. So it is felt that the time has arrived when a consultation by physician and dentist on doubtful cases will be of frequent occurrence and that the patient will in a large measure benefit therefrom.

In addition to the work in this field, the spirit of co-operation between the two professions offers great possibilities along the line of prophylaxis and early detection of pathological conditions. When a dentist makes an examination of mouth conditions, he should, where there are non vital upper bicuspids and molars, always include a transillumination of the antra or have the patient referred to the family physician or the Rhinologist for that purpose. The tonsils should also be examined and if the case is suspicious it should be referred for examination. The significance of this can be appreciated when we consider the number of mouths that are daily seen by dentists.

In cases where the patient is wearing dentures of any type, a very careful examination should be made of any areas that are being irritated. Spots on the tongue and cheeks where jagged pieces of decayed teeth have come in contact with the tissues should be given consideration, and even before the case shows a tendency towards malignancy, it can be referred for examination. In fact, no conditions in the mouth that appear potential of future trouble should be overlooked.

It is now generally admitted that we have changed our opinion of the foundation upon which a large percentage of our mechanical restoration in the mouth has heretofore been constructed. We have come to learn that our paramount duty now consists, not in immediately placing in a mouth, crowns, bridges and fillings, and ignoring many an underlying condition which in certain instances has a most intimate relation to the patient's health and which should govern the type of restoration used, but rather it is now our very plain duty to first make a very complete and thorough examination of the teeth and the supporting and surrounding tissues which influence the type of work. Then establish a condition of health in the mouth. Lastly, consider the plan of restoration.

When the restoration has been accomplished, our responsibility to the patient should be of such a nature that we not only acquaint them with, but thoroughly drill them in the prophylactic care of the oral cavity and of the teeth. We will discuss this in detail later.

Thus it will be seen that just plain dentistry of the future will be in many respects a very different work from that of the past. However, a most interesting feature of it is that the new dentistry as we see it is nothing more or less than an assembling and correlating of the various points of merit in the practices of many of our specialists.

It is now possible to interest the public and dentist in operations of the highest merit much more easily than formerly. Why? Simply because they have all come to realize the vital relation that exists between mouth conditions and the patient's health. Dentistry is not solely a problem in mechanics. We made a mistake when we thought it was.

It is now no longer a question of a competition between the advocates of various types of filling as to who will gain recognition for their pet theory or operation. It is now a case of whether or not the filling actually seals the cavity and preserves the tooth, the pulp and supporting tissues and reproduces as closely as possible that portion of the tooth that has been lost. If the gingival margin does not fit properly and seal the cavity at that point, all the beautiful contour or polish it is possible to give it goes for naught, for decay will set in, the pulp become infected and our operation will have lost its value and benefit to the patient. Similarly, if we fail in reproducing the lost portion of the tooth by lack of proper contour, the sealing of the cavity has failed to accomplish the desired result, and many times trouble follows.

So it is that we must study carefully the points of merit of all types of filling materials. The standards by which we judge them have changed somewhat.

Advocates of Oral Prophylaxis have not made the progress in the past that they will in the future. We now, in our efforts to preserve a condition of health in the mouths of our patients, turn to them for help in establishing in general practice what they have for years carried on in practices of a specialized nature.

We listen now with a keener interest than ever before to the ideas of the Exodontist and are more than ever interested in his findings. As a result we, as a profession, have learned that teeth heretofore considered harmless in many instances show pronounced pathology when extracted.

Until comparatively recently we did not appreciate the value of constructing bridge abutments designed for use on vital teeth. This type of a crown mainly the "three-quarter" type was advocated years ago, but it seemed so much easier to "kill a nerve" and make a Dowel or Banded crown. How differently this particular operation is looked on now. The men who clinic in the construction of bridge abutments on vital teeth are among our most popular clinicians.

Dwell for a moment on our changed attitude regarding children's dentistry. No longer does the most indifferent practitioner neglect decay in children's teeth, but he is keenly alive to the importance of preventing the decay advancing to the point where it involves the pulp.

In Root Canal work we find this field narrowing down to the point where but a small percentage of what was formerly done is now attempted, and instead of being a case of "treating a tooth" or "killing a nerve" it is now considered, and justly so, an operation calling for the highest skill and only to be performed after careful consideration of its advisability. The cause of this change in our attitude is due to one thing, and that is, that we have come to realize that dentistry is a branch of medicine, though highly specialized, and that the work we are doing in the mouth has an intimate bearing on the patient's health. No longer will many of the standards of the past serve to guide us in our work. The profession of dentistry is today experiencing the greatest upheaval of its history. Every branch is being affected.

The frequency with which root end infection occurs justifies us in suspecting it in all cases where we see teeth containing large fillings or crowns or where teeth are somewhat discolored; also, it frequently occurs in the absence of any of these indications. Consequently, it becomes necessary for the dentist to adopt a reliable method of conducting mouth examination. At the same time this examination must not be too intricate or cumbersome or its extensive adoption will be slow, if at all.

It must not be assumed that such work can only be carried on by a specialist. It has such an intimate bearing on so large a percentage of our cases that its daily use by the general practitioner becomes imperative.

When the matter of mouth infection and operations of a mechanical nature have been given due thought, it becomes quite apparent that much of our work in the future will be considered under two heads:

1. We must take up for consideration the operations necessary to place the mouth and jaws in a healthy condition.

2. When such a foundation has been established, we take up for consideration the restorative operations necessary in the mouth.

This procedure is necessary as it is no longer permissible for us to proceed with any such operations in the mouth as we did formerly, unless we feel tolerably certain that they will be reasonably free from infection and that the patient is not being subjected to any unnecessary or injustifiable expense.

In order to cover all the necessary points, the system of examination under consideration consists of:

1. A complete X-ray examination.
2. Study Casts.
3. Vitality Test.
4. Examination of Oral Cavity.

The X-ray examination instead of consisting of simply taking films of "suspicious teeth" should consist of an easily taken and standardized examination of the areas from the 3rd molar to the 3rd molar inclusive in both upper and lower jaws.

In order that such an examination may have the greatest possible value to us, the number of films taken, their location and ray angle should be carefully standardized in order that we may become quite familiar with what constitutes the "normal" condition as revealed by the radiogram.

A few weeks reading films of such a character will prevent some of the ridiculous errors that are frequently made in interpreting the films. Such a procedure would do much in simplifying the diagnosis and would go far to increase the confidence of the patients and dentist in the Roentgenogram. Incidentally, it would soon show what your Essayist has for years contended, and that is, that Radiodontia is the work of a dentist.

The real value of a properly made study cast is only to be appreciated after their use has been adopted for some time. Then it will be found that it is almost impossible to get along without them. However, it is not to be assumed that by study casts is meant the result secured by taking a so-called "mush bite."

In view of the fact that it frequently occurs that a pulp becomes infected and begins to undergo decomposition without the apical tissues becoming involved, it is necessary that each tooth be tested carefully in order to determine the vitality of the pulp. It is quite essential that this be done very carefully by the dentist; otherwise his examination is not much more reliable than can be secured by getting a set of films from an X-ray laboratory, and this latter method is not to be recommended unless it is the only means available.

An ocular examination of the oral cavity has many times constituted all the examination that has been made of mouth conditions. It is quite impossible for us to retain in our mind the conditions which we see in a mouth, so it becomes necessary that they be carefully recorded in a simple, yet comprehensive manner.

When all of the information obtainable from the above mentioned four sources has been assembled, carefully studied and a conclusion arrived at, what a different conclusion that is liable to be than one that is reached after a hurried look into a mouth with the aid of a mirror and exploring instrument.

To anyone who can appreciate the importance of keeping records, an efficient examination chart will appeal strongly. Its particular application is to those cases where a great many reconstructive operations are necessary. Its value is greatly increased where we have cases of mouth infection to deal with.

Dentistry of to-day is no longer a problem in art or mechanics. It is a branch of medical science and as such the relation of our work to the patient's general condition is very close. We play no small part as guardians of the patient's health. The singular part of this condition is that in altogether too many cases the dentist is the one who holds such a responsibility in the lightest esteem. He has failed to arouse in his patients a sense of his responsibility, because he does not feel it himself.

The manner in which a dentist approaches a problem of diagnosis in a difficult case immediately classifies him. If he at once begins to plan on "treating" a tooth here and there, at once decides to use a certain type of bridge, crown or filling, all without a deep study of what is necessary to establish a healthy foundation upon which to reconstruct the broken down masticatory apparatus, then he has not seen the dawn of the new era in dentistry. An excellent example of this type of dentistry came to the observation of the Essayist recently. A young lady came in for an examination in a very unhappy frame of mind. Her mouth was in a most unsanitary condition. She had fourteen pulpless teeth, many decayed to the gum line. From the number of fillings, it was apparent that there had been many hours of dental effort. Within a month previous she had had five proximal gold foil fillings in her lower anterior teeth. Upon enquiry it was found that the dentist in the case had hesitated a little in coming to a decision, but that his indecision seemed to be due to the fact that he did not know whether to use gold or silicate fillings. The patient settled the question for him by expressing a partiality for gold as her mother had some good gold fillings.

This is the type of dentistry that cannot stand much longer. In this mouth full of infection, apparent to any layman, the paramount question was, gold or synthetic. Think it over.

Let none of us deceive ourselves into believing that patients are not aware of what is going on. The construction of dental operations on teeth that should be extracted or in mouths in the presence of apparent infection is a thing of the past.

As a result we find the dentist approaching large problems in reconstruction with great care and study. He realizes that the patient is opposed to "snap opinions."

It is to fill this need that the Examination Chart here described is offered. It is necessary that we know the present condition of the soft tissues in the mouth, the presence and extent of decay, leaking fillings, crowns and bridges that are injuring the tissues, looseness of teeth, what operations are indicated, what the fee is to be and what the patient has been told concerning their case.

We must have the patient's history and a record of the progress of the case, and in focal infection cases a careful record of any change of symptoms. The futility of attempting to retain all this important information in one's mind is quite apparent to any one. The Examination Chart takes care of all the needs of the case and will be found very simple of operation.

When an examination as outlined has been made, it is essential that we have some guide to follow in making our decisions, and in the hope that it will be of assistance, the following is offered:

Concerning the removal of vital tooth pulps (so-called devitalization.)

1. The valuable relation of a vital pulp to the tooth should be recognized by physician, dentist and patient and every effort made to retain its vitality.

2. A tooth which has lost its pulp is a "pulpless tooth" and not necessarily a "dead tooth," any more than a tooth affected with Pyorrhea Alveolaris and having lost its peridental membrane is a "dead tooth." This term is properly applied when both the pulp and peridental membrane are lost.

3. Patients should be instructed to be on the alert against symptoms indicating early pathology in the pulp, either of hasmotogenious origin or the result of decay or trauma. Such symptoms should be carefully explained to patients by the dentist.

4. Physicians and dentists should continually impress upon patients the great importance of Oral Prophylaxis as a means of preventing tooth decay which may lead to pulp death and result in serious infection.

5. No Root Canal operation of any character (aside from emergency cases) should be attempted in a mouth in the presence of infected teeth. (Apical abscesses or pyorrhea alveolaris.)

6. It is no longer considered necessary to devitalize a vital pulp for the following purposes:

(a) To avoid pain in cavity preparation.

(b) To facilitate the use of bridges or splints which were designed for use on pulpless teeth.

(c) To use a full gold banded or cast crown.

(d) To use a Dowel crown on an anterior tooth for aesthetic purposes when enough of the natural crown is left for the construction of a Porcelain Veneer crown.

(e) When pain occurs in a tooth having a recently inserted filling, when such pain is simply due to sensitiveness and not due to exposure or disease in the pulp.

(f) Where there is a deep cavity, if the pulp still retains its vitality and has not ached extensively, provided all the softened dentine can be removed without actual pulp exposure.

7. The removal of a vital pulp must not be considered except as a procedure of surgical necessity.

8. The value of the tooth will in all cases determine whether it will be extracted or an effort will be made to retain it by a Root Canal operation.

9. Pulp removal and the sealing of the canals is permissible under the following conditions:

(a) In case of caries or in accident to a valuable tooth, when our diagnosis is that the pulp will die and become infected if allowed to remain.

(b) In case of a formation of secondary dentine, where there is a pressure on the nerve fibrils in the remaining pulp tissue resulting in great pain, or where the pulp by easily recognized symptoms is in an advanced hyperemic or inflammatory condition and is breaking down.

(c) In case of a tooth which is of sufficient value from the standpoint of its position in the mouth and its relation to other teeth, and which has lost so much of its crown that it affords no anchorage for a filling or crown.

Concerning teeth with infected non vital pulps.

10. All infection, whether in canals or apical areas, must be removed.

There are two main divisions of teeth in this class:

Class A—Teeth with incompletely formed roots.
Class B—Teeth with completely formed roots.
Subdivision of Class B.

1. Those teeth where there is infection present in the canal and in the apical region.

2. Those teeth where the infection is still confined to the pulp chamber or root canals, diagnosed radiographically.

All teeth of subdivision 1 of Class B should be extracted if they are distal to the cuspid. If it should happen to be one of the six anterior teeth, curetment and resection may be indicated if the infected areas are thoroughly removed and the dentine is efficiently sterilized.

In subdivision 2 of Class B, if from a bacteriological examination the canals are proven free from infection, especially when cultured at the apex, they may, if valuable teeth, be saved.

If they cannot be made free from infection at the apex, they should, despite our X-Ray findings, be treated as belonging to subdivision 1, of Class B.

11. Teeth containing well filled roots should be diagnosed according to X-Ray findings.

12. Teeth containing doubtful canal fillings to be treated the same as teeth with infected pulps.

13. All pulpless teeth should be radiographed occasionally to check up apical conditions.

14. The above conclusions are in cases showing no symptoms of systemic involvement from focal infection.

15. In cases showing symptoms of focal infection, more stringent precautions are observed.

16. Where decay occurs in vital teeth in cases of pregnancy, it is advisable to remove as much of the decay as possible without too

great pain, and seal the cavity with cement after taking every precaution to protect the pulp. Where disease conditions at the root ends exist, such conditions should be removed and the mouth should be kept in as hygienic a condition as possible.

Radiographic examination of many mouths will reveal the fact that most of the pulpless teeth carry large fillings, showing that many of these teeth had quite extensive decay; also, there seems to be a prevailing opinion on the part of most patients that the majority of such teeth had the nerves "killed" instead of being "treated." It seems to be a fair assumption that generally dead pulps were "treated."

Using this as our basis we find that in all probability most of the teeth having lost their pulps are in the present condition because the dentist felt that the removal of all of the decay would cause the exposure in case exposure has not already taken place. The prevailing teaching in the past has been to remove all decalcified dentine regardless of the possibility of exposure of the pulp, consequently a large percentage of pulps were destroyed because the dentist thought that their removal was positively indicated.

It is to this particular class of cases we will refer for a few moments. In 1905, Dr. C. N. Johnson, in an interview with the Essayist, advised that rather than destroy the living pulp, especially in a molar, a layer of partially decalcified dentine might be left to protect the pulp providing the rest of the cavity was cleaned and a conscientious effort made to sterilize the remaining questionable dentine. Since that time, your Essayist has tried many plans for saving vital pulps of teeth in which there is considerable decay. Some have been fairly successful and some have failed.

In no work undertaken has there been such an incentive to carry through to a successful conclusion the task in hand, and at the same time I have never had so many disappointing and disheartening experiences. In most experimental and research work, if results are not what one counts on, it as a general rule simply means a little more time. But in this work a failure means the loss of a pulp in addition to loss of time. Various materials and methods were used and the one which gave the more nearly uniform results has been selected. It has been found that Williams' Magnesium Zinc Silver Nitrate and Pimento Eugenol has been the most beneficial and most uniformly successful.

It must, of course, not be unfairly assumed that all pulps in the teeth having decay can be saved. We must be judicious, and my fear in offering this treatment is that it will be maltreated and not given a fair trial.

Our first step in handling one of these cases is by a vitality test to make sure that the tooth is vital; also, be sure it has not ached too extensively. (In case it has ached, you must use your own judgment in trying to save it). If it is a favorable case, apply the rubber dam. Unless you are willing to do this, don't expect as much success as you otherwise will get, especially in the lower teeth. Dry the tooth and open the cavity with sharp chisels. Apply warm Dakins solution (Nuklorene), then dry the tooth and cavity. With sharp, round burs and excavators, remove all decay short of actual pulp exposure. Wipe out cavity with warm Dakins solution. Dry thoroughly, mix the Silver Nitrate Eugenol paste and with an exploring instrument place a little in the bottom of the cavity on the discolored dentine. Carefully spread it over the entire base of the cavity but keep it away from the enamel. Place a pledget of cotton in the cavity and gently force the preparation to place. This also absorbs some of the moisture and hastens the setting. Remove the cotton and trim the edge carefully with the exploring instrument. This material as well as the unprotected dentine must not be exposed to the saliva. Hence, the entire floor of the cavity is now covered with Oxy Chloride of Zinc Cement. To apply this cement, mix fairly thick. Place in cavity and force to place with cotton pellet. Later trim away surplus. The cavity is now finished with a hard cement. These cases should be given at least six months to recover before permanent fillings are inserted.

In anterior teeth where, on account of discoloration we fear to use Silver Nitrate, an amount no larger than a pin head will many times be found sufficient or the preparation can be made up without it. It will be found that the above mentioned plan will save thousands of dental pulps that formerly were lost on account of decay. However, some will die in spite of this treatment, and when this occurs we must seek some other means of handling the case. We have, of course, a preventive for most of the carious conditions in the teeth. It is to be found in Oral Prophylaxis. Not spasmodic, erratic work, if you please, but careful well ordered systematic work.

In closing this paper, it is with the most profound hope that you may be inspired by the same spirit of optimism your Essayist was when he wrote it. If we are not satisfied wtih affairs as they exist, let us change them. There is abundant satisfaction to be drawn from doing things in this world. We can do almost anything we want. The reason we fail, as a general rule, is that we don't "want to" badly enough. We long for the ideal, the pleasing, the satisfying, the inspiring condition, but the question is, do we want it badly enough to go out and drag it in by the tail?

Department of Soldiers' Civil Re-Establishment

PROCEDURE OF DENTAL BRANCH.

THE procedure of the Dental Branch of the S.C.R. has been issued by the Department in the form of Regulations and Instructions. The contents is divided into two sections, covering Dental Service Regulations and Standard Table of Dental Supplies and Equipment.

The Dental Service Regulations are published herewith in full, because of their great public interest and their special value and interest to the members of the Dental Profession.

The Canadian Army Dental Corps continues to supply adequate dental service to the soldier up to the time of his discharge. Following that period the Department of Soldiers' Civil Re-Establishment has jurisdiction.

Dr. R. B. O'Sullivan has performed a most excellent service in his work as Director of Dental Services of the S.C.R. and is to be highly commended upon the organization of his department. Dr. O'Sullivan has shown himself to be "the right man in the right place" and will doubtless render a great public dental service to our discharged soldiers. In rendering that service, Dr. O'Sullivan may count upon the sympathetic and active co-operation of every Dentist in Canada.

Copy of regulations adopted by the S.C.R. and issued to be observed with effect from the 12th of March, 1920, is as follows:

Introduction.

Prior to December, 1919, Dental Services rendered by the Department of Soldiers' Civil Re-Establishment were under the control of the Medical Branch of the Department, but, as a result of representations made by the leading members of the profession, the Department decided that, to secure the best results, it was advisable to place Dental Services under a Dental Executive.

Valuable assistance has been received from Dentists during the initial steps of organization and many of their suggestions have been embodied in the Dental Procedure.

The paramount importance of Dentistry in the physical well being of nations is now recognized, and it is the duty of the profession to strive more vigorously than ever for the highest standard possible, in whatever branch of work its representatives are engaged.

The administration of the Dental Branch of the Department presents two phases—the Ethical and Commercial.

To attain the former, the sympathy and practical co-operation of all Dentists are solicited.

A scale of fees has been adopted, applicable to the Dominion, for services rendered by civilian Dentists to S.C.R. patients in localities where the Dental Branch has not established a Clinic.

Owing to dissimilarity in prices, the Dentists in the various Provinces will assist materialy by adopting the scale of fees of the Dental Branch in connection with services rendered to the wards of the Dominion.

Similar action has already been taken by a sister profession under similar conditions.

The Commercial phase applies to all who render service under the Dental Branch.

The position of the Director of Dental Services is similar to that held by the Dominion Manager of a Corporation, and it is intended to administrate the Commercial part of the Dental Branch on the same lines as those of a private Corporation.

Efficiency, in the full sense of the word, must prevail in every detail of service rendered, and great care must be exercised that waste of material and unnecessary expenditures do not occur.

The co-operation of all members of the Profession, both in and out of the service, is earnestly solicited.

R. B. O'SULLIVAN,
Director Dental Services.

DENTAL SERVICES.

Scope of Regulations.

Clause 1. No dental treatments will be granted by the Department except as provided for in these Regulations, (Chapter XIV).

Functions of Dental Branch.

Clause 2. The Dental Branch, Department of Soldiers' Civil Re-Establishment, is charged with the provision of dental treatment, either by dentist on the staff of the Department, or by special arrangement with civilian dentist at outside points, to ex-members of the Forces as hereinafter indicated:

1. Ex-members of the Forces on the treatment or training strength of the Department;
2. Ex-members of the Forces who require dental treatment for repair of direct damage to the jaw or teeth resulting from war service. This class includes cases of recurrence of infected mouth due to service which requires treatment for a toxic systemic condition, provided the medical examiner finds the general condition due to the recurrence of oral infection.
3. Ex-members of the Forces referred to the Department by the Board of Pension Commissioners when it is considered that dental treatment is necessary to lower pensionable disability.

Personnel, Dental Branch, Duties and Author of.

Clause 3. (a) **Director of Dental Services.** This officer shall have charge of the Dental Services of the Department, and shall be responsible to the Deputy Minister for the proper direction thereof; he shall be responsible for the efficient organization of the Dental Branch and shall have complete jurisdiction over all personnel employed by that Branch.

(b) **Deputy Director of Dental Services.** This officer shall act as the Assistant to the Director of Dental Services and shall exercise such authority and perform such duties as are delegated to him by the Director of Dental Services.

(c) **Unit Dental Director.** This officer shall have charge in a Unit of the Dental Branch of the Department, and shall be responsible to the Director of Dental Services for the proper control and management thereof.

(d) **Dental Surgeon.** A Dental Surgeon employed by the Department shall be responsible directly to the Unit Dental Director unless employed in a Hospital or Sanatorium of the Department, in which case the Dental Surgeon will be responsible to the Medical Superintendent that all dental work required is performed and that the regulations of the Hospital or Sanatorium are properly observed, but in all other respects he shall be responsible directly to the Unit Dental Director, and shall perform such duties as are delegated to him by the Unit Dental Director.

(e) **Dental Representative.** When considered necessary by the Director of Dental Services, a "Dental Representative" will be appointed to treat such dental cases as are referred to him by the Unit Dental Director to whom he will be responsible for the proper performance of such work. A Dental Representative will not be placed on salary but will be paid according to "Schedule of fees" herein contained for work actually done.

(f) **Subordinate Dental Staff.** Subordinate Dental Staff will be responsible to and under the direction of the Dental Surgeon with whom they are employed.

Appointment and Control of Staff.

Clause 4. (a) Regulations governing the appointment and control of staff are contained within Chapter I. of these Instructions and all Dental Officers will be governed thereby, but in addition will observe the following instructions which relate to the Dental Branch in particular.

(b) A Certificate indicating the physical fitness of the applicant will accompany all recommendations for the appointment of additional dental staff. Persons with active tuberculosis must not be employed, but those with arrested or quiescent tuberculosis may be recommended for employment.

(c) When it is desired to obtain the services of a returned dental officer at present on duty with the Department of Militia and Defence, application for release from the Canadian Army Dental Corps for duty with the Department of Soldiers' Civil Re-Establishment will be made by the officer concerned to the Unit Dental Director of this Department, and by him to the Director of Dental Services, Head Office.

(d) Subject to Clause 9 of the Regulations for "Control of personnel," (Chapter I.), Unit Dental Directors may transfer personnel of the Dental Branch from one institution or office within the Unit to another institution or office in the same Unit, but shall report such transfers on Form 119 to the Director of Dental Services. In cases where such a transfer involves a promotion or change in salary, Clause 8 of the Regulations for "Control of personnel" (Chapter I.) must be strictly observed.

Office Hours.

Clause 5. The offices of the Dental Branch of the Department will be open from 9 a.m. to 5 p.m. daily except Saturday when the hours will be from 9 a.m. to 1 p.m. In the larger centres where night clinics are established, the offices of the Dental Branch will also be open from 7 p.m. to 9 p.m.

Eligibility to Dental Treatment.

Clause 6. (a) Ex-members of the Forces as hereinafter indicated shall be entitled to Dental Treatment by the Department:

1. Ex-members of the Forces on the treatment or training strength of the Department;

2. Ex-members of the Forces who require dental treatment for repair of direct damage to the jaw or teeth resulting from war service. This class will include cases of recurrence of infected mouth due to service which requires treatment for a toxic systemic condition, provided the Medical examiner finds the general condition due to the recurrence of oral infection;

3. Ex-members of the Forces referred to the Department by the Board of Pension Commissioners when it is considered that Dental treatment is necessary to lower pensionable disability.

(b) Ex-members of the Forces described in (a-1) above are already on the strength of the Department and will receive dental treatment only when it is indicated by the Unit Medical Director that such dental treatment will improve the man's general condition.

(c) It is understood that the Canadian Army Dental Corps completes the ordinary dental treatment of men provided with "Dental Certificates" on discharge.

Admission of Dental Cases.

Clause 7. (a) The Unit Assistant Director shall be notified by the Unit Dental Director of all men who are taken on the strength of the Department for Dental treatment only and of the institution to which they are to be admitted. The Unit Dental Director will furnish the Unit Assistant Director with (S.C.R. Form 350) duly completed with respect to all such cases, and will indicate thereon whether the subject is to be an in-patient or an out-patient, and such other particulars as will enable the Unit Assistant Director to determine the rate of allowances, if any, to which the subject is entitled.

(b) In cases where an ex-member of the Imperial, Allied or Colonial Forces other than Canadian or Newfoundland, is referred to the Unit Dental Director for dental treatment, the Unit Dental Director will examine the case and determine whether he is eligible to treatment under Clause 6, above. If the man is found eligible, full particulars of the case will be submitted to the Unit Assistant Director, and no other action will be taken to provide dental treatment until the Unit Assistant Director has certified that the man is a bona fide ex-member of the Imperial, Allied or Colonial Forces (other than Canadian or Newfoundland), and as such entitled to receive treatment from the Department.

Allowances.

Clause 8. The rate of pay and allowances to which ex-members of the Forces are entitled while undergoing dental treatment will be determined by the Unit Assistant Director as provided in Chapter V. of these Regulations. As a general rule the following will apply:

1. Ex-members of the Forces as described in Clause 6 (a-1) will continue to receive the pay and allowances to which they are entitled as being on the treatment or training strength of the Department;
2. Ex-members of the Forces as described in Clause 6 (a-2) will receive either full pay and allowances as provided in Chapter V. of the Regulations, or will be taken on strength as out-patients, Class 2, and granted allowances for the time lost in attending for treatment according to the circumstances of the individual case;
3. Ex-members of the Forces as described in Clause 6 (a-3) will receive only such allowances as are necessary to compensate them for time actually lost from work as in the case of out-patients, Class 2.

Type of Dental Work Authorized and Performance of the Same.

Clause 9. (a) The Dental Branch of this Department will assume responsibility for the Dental Treatment of ex-members of the Canadian Forces, irrespective of rank, when such treatment is necessitated by disability contracted on or aggravated by service, to the extent of furnishing extractions, porcelain and amalgam fillings and ordinary vulcanite dentures.

(b) Under certain conditions plates with one or two teeth are useless and bridges are indicated. Before the Operator undertakes the making of a bridge, he must first obtain the written sanction of the Unit Dental Director, and the latter will keep a record of such cases permitted and forward copy of record to Headquarters, Dental Services (Form S.C.R. 388).

(c) When ex-members of the Canadian Expeditionary Forces desire gold bridge work, in cases where plates are adaptable, the same will be made, but the cost will of necessity be made a charge against the Officers and men concerned, and the dentist, whether on the Strength of the Department of Soldiers' Civil Re-Establishment or not, must obtain from the ex-members of the Forces the amount of cash necessary, before such gold work is commenced. It must be distinctly understood that cash alone is the basis on which such work is performed. Cost of Crowns to patients who are entitled to only dentures:

Gold Crowns, Molar	$5.00
Gold Crowns, Bicuspid	4.00

Gold and Porcelain, dummies	3.50
Porcelain Crowns	3.00

(d) Dentists on the Strength must keep an accurate account of the amount of gold used in each crown and bridge operation, and at the conclusion of the work obtain a signed statement from the patient of the amount of work performed, and that he (the patient) is satisfied with the work, and forward same to the Unit Dental Director with covering Dental Chart at the end of each week with cash received for cash cases (Form S.C.R. 389). The Unit Dental Director will forward to the Director Dental Services monthly report covering these cases in the Unit, and mail cheque for the amount of cash received (Form M.F.W. 50A).

(e) In cases where it is considered that the disabling condition is secondary to the need for Dental Treatment, Dental Representatives will receive from the Medical Staff, suggestions regarding the details of such treatment, which are considered immediately necessary.

(f) Dental Surgeons in Hospitals or other D.S.C.R. Institutions under the charge of a Medical Superintendent, must be prepared under the direction of the Superintendent to inspect all new patients admitted to the Institution for the purpose of commencing at as early a date as possible all dental work, to receive which, the patient is eligible.

Return of Dental Cases, S.C.R. Form 105.

Clause 10. S.C.R. Form 105 "Return of Dental Cases" will be forwarded daily by each Dental Surgeon to the Unit Dental Director or his Deputy. This form will indicate:

1. Particulars of the patient.
2. Date on which patient reports for treatment.
3. The rate of allowances, if any, to which patient is entitled.

Unauthorized Dental Work.

Clause 11. The Department will assume no responsibility for the payment of accounts for Dental Treatment incurred without the authority of the Department.

Treatment of Patients.

Clause 12. (a) Unit Dental Directors will make arrangements with civilian dentists at outside points, where no Dental Representative of this Department is established, for dental treatment of ex-members of the Forces, who are eligible to receive such treatment under the regulations of this Department.

(b) After a civilian dentist, preferably one who has been Overseas, has been selected, and before he undertakes to do any work, except that of an emergency nature, such as treating or extracting an aching tooth, he must submit to the Unit Dental Director, a Dental Chart (M.F.B. 466) indicating the work to be performed and the cost of same.

(c) Before the Unit Dental Director authorizes the work to be done, he must satisfy himself that the proposed patient is eligible to have the work done, and that the charges are in accordance with the "Schedule of Fees" attached. He should also consult the Unit Assistant Director as to whether the patient is to be classified as an out-patient, Class 2, or not.

(d) At the conclusion of the work, the civilian dentist will forward to the Unit Dental Director, in conjunction with his account, a written statement in quadruplicate of the work performed and signed by the patient (S.C.R. Form 387), and endorsed by him as being satisfied with the work.

(e) This work will be entered on a separate form (S.C.R. 387) by the Unit Dental Director, and kept as a separate record.

As soon as the record has been made and the accounts in quadruplicate approved by the Unit Dental Director, one copy will be sent to the Director Dental Services, and the other three to the Unit Assistant Director for payment.

Operations performed by Civilian Dentists will be classified under weekly and monthly reports separately.

Accounting for Dental Supplies and Equipment.

Clause 13. At the end of each three months, commencing the first day of April, 1920, the Dental Stock Sheet, (S.C.R. Form 394) will be completed in triplicate, indicating the amount of stock on hand, and the amount used during the last quarter. One copy will be kept on file and two copies forwarded to the Unit Dental Director, who will retain one copy and forward the other to the Director Dental Services, Ottawa.

Dental Cases Resident in the U.S.A.

Clause 14. Whenever the case of an ex-member of the Canadian or Imperial Forces who is resident in the United States of America is referred to the Unit Dental Director or his Representative, the Unit Dental Director will cause all correspondence and particulars of the case to be referred to the Director of Dental Services at Head Office. The Director of Dental Services will make any necessary arrangements for the treatment of such cases.

C.E.F. Dental Cases Resident in United Kingdom.

Clause 15. Whenever the case of an ex-member of the Canadian Forces who is resident in the United Kingdom is referred to the Unit Dental Director or his representative, the Unit Dental Director will cause all correspondence and particulars of the case to be referred to the Director of Dental Services at Head Office. The Director of Dental Services will make any necessary arrangements for the treatment of such cases.

Schedule of Fees for Dental Work.

Clause 16. Any Dental work properly authorized by the Department and performed by civilian dentists (who are not in receipt of salary from the Department of Soldiers' Civil Re-Establishment) for ex-members of the Forces, will be paid for by the Department in accordance with the appended schedule of fees:

Schedule of Fees.

Cleaning of Teeth	$ 1.50
Fillings—	
Oxyphosphate	1.50
Silicate	2.00
Cement (Pulp Capping)	1.00
Devitalization	.50
Root Filling	1.50
Amalgams (Simple)	1.50
(Compound)	2.00
Gold fillings when specially authorized in exceptional cases.	
(Simple)	3.50
(Compound)	5.00
Gold Inlays (Simple)	3.50
(Compound)	5.00
Rubber dam must be used with all fillings.	
Extractions—	
Without anaesthetic for one tooth	.50
With local anaesthetic, one tooth	1.50
For each additional tooth	.50
Dentures—	
Partials for four teeth or under	6.00
For each additional tooth over four	1.00
With gold clasps, for each clasp	1.50
Full Upper Dentures	20.00
Full Lower Dentures	20.00
Both full Upper and full Lower, at the same time, for the same patient	35.00
Charges for extraction of teeth when plates follow are not allowed.	
Repair of Dentures	3.00
For replacing or adding, each tooth	1.00

Crowns—	
Gold	10.00
Gold with dummy	15.00
Porcelain	8.00
Bridges—	
Abutments, each	10.00
Dummies, each	6.00
Replacing facing or bridge, each tooth	2.00

Pyorrhoea cases to be referred to Unit Dental Director.

Transportation Warrants.

Clause 17. (a) Transportation Warrants will be issued by the Unit Assistant Director or his Representative at the request of the Unit Dental Director when required for the following:

1. Ex-members of the Forces called in for treatment or examination;
2. Ex-members of the Forces returning home on completion of treatment;
3. Personnel of the Dental Branch proceeding on duty.

(b) Transportation Warrant Books issued for use of individual officers of the Department will not be used for any other purpose than for personal transportation.

(c) Standing Order Numbers as indicated on the fly leaf of Transportation Warrant Books must be shown on each Transportation Warrant issued.

Dental Supplies.

Clause 18. (a) Dental Supplies shall be requisitioned for monthly in advance, and in sufficient quantity for a month's supply. Responsibility for the maintenance of proper dental supplies will rest with Unit Dental Directors.

(b) In cases of emergency the Unit Assistant Director has authority to make purchases of dental supplies and equipment up to the value of $50.00 on the written requisition of the Unit Dental Director. All such requisitions shall be signed by the Unit Dental Director and submitted in duplicate to the Unit Assistant Director. A triplicate copy of the requisition will be forwarded to the Director of Dental Services, Head Office. A quadruplicate copy will be retained by the Unit Dental Director for his files. S.C.R. Form 084 shall be used for all such emergency requisitions for dental supplies. The procedure to be followed in completing this form will be found in Chapter VIII. of these Regulations, i.e., Instructions of Supplies and Equipment Branch.

(c) Dental Supplies obtainable from the Stores of the Department of Militia and Defence are listed in the table of Dental Supplies and Equipment contained within Section II. of this Chapter, and all such supplies will be requisitioned for on Form (M.F.B. 726). This form will be completed in quintuplicate by Unit Dental Directors. The quintuplicate copy will be retained by the Unit Dental Director for his file, the first four copies will be forwarded by him directly to the Director of Dental Services, Head Office, who after approval, will retain one copy of the requisition for his files and forward three copies to the Quartermaster C.A.D.C. Central Stores, Ottawa.

Dental Returns and Forms.

Clause 19. In order that accurate records may be kept the following Forms will be used by Unit Dental Directors and their Representatives and necessary returns forwarded as herein indicated:

S.C.R. Form 30—Notification from Unit Medical Director to Superintendent of Hospital. (Mentioned for information).

M.F.B. Form 467—Appointment Card for Dental Patients.

M.F.B. Form 465—Dental Chart. Record for Clinic.

S.C.R. Form 31—Notification of admission of patient from Medical Superintendent to Unit Medical Director. (Mentioned for information).

S.C.R. Form 101—Records of appointments of Dental Clinic.

M.F.B. Form 466—Dental Work Chart. (See page 7).
S.C.R. Form 32—Notification of Discharge or Transfer from Medical Superintendents to Unit Medical Director. (Mentioned for information).
S.C.R. Form 387—Work by Civilian Dentist authorized by Unit Dental Director. (See page 8).
S.C.R. Form 388—Return of Crown and Bridge Cases, free of charge. (See page 6).
S.C.R. Form 389—Return of Crown and Bridge Cases, charges made. (See page 6).
S.C.R. Form 105—Daily Report. (Short Form). (See page 7).
M.F.W. Form 50B—Daily Report. (Long Form, alternative to 105).
M.F.W. Form 50—Weekly Report to Unit Dental Director.
M.F.W. Form 50A—Monthly Report. (See page 6).
S.C.R. Form 394—Dental Stock Sheet. (See page 8).
S.C.R. Form 62—Requisition on Unit Storekeeper for Stationery and similar supplies through Assistant Director of Unit.
M.F.C. Form 726—Requisition for Dental Stores. (See page 11).
S.C.R. Form 084—Requisition for articles not included in Nomenclature of Dental Stores. (See page 11).
S.C.R. Form 85s—Receiving Slip.
M.F.C. Form 574—Issue Voucher.
S.C.R. Form 364—Recommendations for appointments. See Chapter 1, Section 2, regarding Personnel).
S.C.R. Form 119A—New Appointments. (See Chapter 1, Section 2, regarding Personnel).
S.C.R. Form 119—Staff changes. (See page 3).
S.C.R. Form 55—Nominal roll of staff.
M.F.C. Form 617—Packing Slip.
S.C.R. Form 350—Admission of Dental Cases. (See page 4).

Alterations to Buildings, or Offices.

Clause 20. The structural maintenance and upkeep of all institutions of the Department come under the direct charge of the Engineering Branch. When it appears to a Unit Dental Director or his Representative that alterations or repairs of any kind are indicated, the Unit Dental Director will get in touch with the Superintendent of the Engineering Branch, who will proceed as provided in Chapter IX. of these Instructions. The Unit Dental Director will immediately advise the Director of Dental Services of all such alterations, etc., suggested to the Engineering Branch by him.

Transfer of Dental Equipment, from Department of Militia and Defence to D.S.C.R.

Clause 21. (a) Transfers of equipment from the Department of Militia and Defence to the Department of Soldiers' Civil Re-Establishment are entirely under the control of Head Office, Department of Soldiers' Civil Re-Establishment. In so far as the Dental Branch is concerned therein, Dental Officers will place their services at the disposal of the Board appointed by the Department to examine the stores which are being transferred, for the purpose of rendering assistance in examining and checking the same.

(b) The procedure followed in transfers as described in (a) is as follows:

1. A Board consisting of the Unit Assistant Director and two other officers of the Department is appointed, for the purpose of accepting transfer of institution and stores contained therein from the Department of Militia and Defence. A complete room to room inventory of the equipment is made in septuplicate and signed at the time of transfer by the Board representing the Department of Militia and Defence as well as by the Board representing the Department of Soldiers' Civil Re-Establishment.

2. All articles of dental supplies and equipment will be checked by a Dental Officer acting under the direction of the S.C.R. Board. This Dental Officer will be responsible that each article transferred is accounted for on the list and that articles which belong to the owner of the building (in cases where the building is taken over by this Department) are shown as "On Loan." Articles that are not required by this Department or articles that have become of negligible value through use shall be rejected and the S.C.R. Board so notified. This Board will then advise the Representative of the Department of Militia and Defence to remove the rejected articles. The articles rejected will not be shown in the inventory of transfer. If the Representatives of the Department of Militia and Defence show any disposition towards the non-removal of the unserviceable articles, their condition will be carefully noted on the inventory for further adjustment.
3. In describing articles of furniture or equipment, standard nomenclature, as contained within the table of Supplies and Equipment, will be used.
4. Immediately Dental Supplies and equipment are turned over to him by the S.C.R. Examining Board, the Dental Officer will forward in duplicate a copy of the inventory of such dental articles, signed by a member of the D.S.C.R. Board, to the Unit Dental Director, who will retain a copy for his files, forwarding the duplicate to the Director of Dental Services, Head Office.

WEEKLY RETURNS BY UNIT DENTAL DIRECTORS.

Unit Dental Directors will obtain from their operators, returns of the work performed each week, forwarding summary report by lettergram each Saturday night as per following instructions and supplementing same with a written report of the work of each individual operator. The lettergram will contain the information in accordance with the last six items on M.F.W. 50, namely: Examined, Previously treated, Not previously treated, Completed, Incompleted, No. of operations. In this resume special cases will be included in the No. of operations. In sending the lettergram the following letters will indicate the words for which they stand:—

X.	Examined.
P.T.	Previously treated.
N.P.T.	Not previously treated.
C.	Completed.
I.	Incompleted.
O.	Operations.

and the lettergram should be sent as per the following wording submitted as sample:—

Director Dental Services, D.S.C.R.,
22 Vittoria Street,
Ottawa, Ontario.

X	200
P. T.	50
N. P. T.	150
C.	80
I.	120
O.	400

This lettergram will be followed by M.F.W. 50, forwarded by mail.

The Canadian Dental Association Meeting

S. G. McCaughey, D.D.S., Ottawa.

THE 10th Bi-ennial Convention of the Canadian Dental Association to be held in Ottawa, August 17, 18, 19 and 20th, is the first to be held in Canada in four years, the last meeting being in Chicago in 1918 in conjunction with and as the guests of the National Dental Association of the U.S.A.

The executive are determined to make this the best meeting yet held by the C.D.A., to provide a programme which will appeal to all, to present practicable teaching of possible methods for the everyday practitioner, and ideal procedure for our inspiration and incentive.

Canada now has 2,600 practising dentists; and C.D.A. conventions, being held only once in two years and being nation-wide in their scope, ought to be the biggest thing in dentistry in Canada. You have your share of responsibility in this: that is to attend the convention, to influence "the other fellow" to come, and when you do come to take an active interest in the proceedings.

The Ottawa Normal School, which is central and admirably suitable for the occasion, has been secured. Don't let the thought of the heat stop you. The school is situated beside Cartier Square and in the middle of a park, the breeziest place in the heart of the city.

Ottawa will be at its best in August. It will be a wonderful opportunity to see the Capital City, the new Parliament Buildings, the famous driveway, the scenic Gatineau district of the Laurentian Mountains and the Ottawa River basin.

A strong local committee has been formed under the chairmanship of Dr. C. H. Juvet, which will provide for you a profitable and pleasant experience. The following men have been secured to date for the papers and discussions:

Drs. Kirk, of Philadelphia; Clyde Davis, of Lincoln, Nebraska; Weston Price, of Cleveland; Charron, of Montreal; G. K. Thompson, of Halifax; Wallace Seccombe, of Toronto; The Hamilton Clinic Club, and Doctors Webster, Thornton, Nolan and Woodbury of the dental departments of the Universities of Dalhousie, McGill, Laval and Toronto.

Table clinics will be given by men from every Province. The meeting will be under the chairmanship of Dr. Frank Woodbury, of Halifax.

Another matter of historic interest is that an association has been formed for the purpose of co-relating the work of the various Canadian Dental Colleges, to be known as the Canadian Dental Faculties Association. The first annual meeting of this association will be held in Ottawa during the meeting of the C.D.A. Do not fail to come. You will find the meeting a wonderful help and you will renew once again the friendships of your college days.

Fifty-Seventh Annual Meeting of the Illinois State Dental Society

W. B. T. AMY, D.D.S., TORONTO.

THE Fifty-Seventh Annual Meeting of the Illinois State Dental Society was held in the city of Chicago, at the Congress Hotel, on March 22nd-25th, 1920, inclusive.

Like all meetings of this Society, it was worth taking a long journey to attend. The amount of detail work involved in putting on a convention of the size and scope that this Society undertakes, and the success attained, reflects considerable credit on the executive that each year attempts to "put it over."

With an attendance this year of over 2,000, the convention was everything that the most sanguine of its members could wish. From the President, Dr. Dittmar's address on, there was not a quiet moment; in fact, if one could criticize, it would be that there was too much for the average man to grasp.

The scope of the convention embraced almost all of Dentistry. Dr. Frederick Noyes, Dr. Newton G. Thomas, Dr. Wm. G. Skillen, all of Chicago, gave intensely interesting papers, with wonderfully instructive lantern slides on "The Structural Characteristics of the Region of the Root Apex." These men have been engaged for some time in research work on this subject, which at the present time appears to be one of the most important in Dentistry. Our future success depends almost entirely upon what such men as these find out about these structures. Many facts that they have discovered about this interesting area are new, and I believe were given their first public utterance at this meeting,—such as the structure of root end, the cause of infection after passing through the foramina, how the foramina are formed, etc. The growth of the tooth was followed from its embryonic to its fully developed stage.

Dr. Arthur D. Black gave a very able paper, illustrated by lantern slides, on "Root Fillings and Alveolar Abscesses." This paper gave experience in his own practice, extending over some years. Ninety-four per cent of pulpless teeth treated and filled after seven years showed no periapical difference, and out of 1,500 examined in one of the colleges after six years, only 9% of good root canal fillings. This paper was given to show that teeth with root canals carefully treated and filled can be retained safely.

Dr. Logan, in a clear-cut, decisive paper, gave his opinion on "Should all Pulpless and Infected Teeth be Removed?" He talked from four heads:

1. A review of the conflicting opinions of a relationship existing between focal infection associated with teeth and systemic disease.

2. Definite statement of the essayist's opinion as to what he believes to be appropriate practice in the management of these cases, until additional evidence is presented.
3. Is curettement always indicated when a tooth about which there is a chronic periapical infection is extracted?
4. Statements bearing upon the surgical management of these cases.

Dr. Logan went on to demonstrate that many systemic disturbances no doubt came from infection from foci in connection with the teeth, but that there were many factors to be considered in the treatment thereof,—(1) What is the health of the patient? (2) What is clinical history? (3) What does the X-Ray show? All of these things must be ascertained before an intelligent diagnosis can be made.

By slides he showed the relative involvement of bone that required curettement. In minor rarefied areas he claimed that curettement was not necessary, but in larger areas that curettement should be done; that curettement in the larger areas could not often be satisfactorily done through the sockets, but that buccal flaps should be raised and the operation performed through the buccal plate. If very large, the cavities should be packed so that area could fill in from inside out, but in smaller ones the flap could be returned to place and healing would take place.

This paper caused considerable discussion, as there were a number of men who believed in curettement in all stages of resorption and necrosis caused by infection.

Space will not permit me to give in any detail the excellent papers of Dr. Knapp of Des Moines, Iowa, on the technic of "Casting Inlays and Small Castings"; of Dr. Roach on "Small Castings for Prosthetic Work"; of Dr. Goslee on "Fixed and Removable Bridge Work"; or of Dr. Essig on "Selection of Tooth Forms and their Adaptation to Prosthetic Requirements."

Dr. Fones, of Bridgeport, Conn., gave a very interesting paper on "Oral Hygiene as a Public Health Factor," achieving wonderful success, so his statistics show, in the schools by the use of trained lady Oral Hygienists.

It would not be fair or right to complete even this fragmentary article without some comment on the Tuesday proceedings. This day was taken charge of by the Chicago Dental Society. Clinics were given both morning and afternoon on practically all of the subjects that were covered by the papers. These clinics were numerous and excellent enough to be sufficient for the usual convention, but when given in conjunction with the numerous instructive papers mentioned before, and the wonderful exhibit of the Dental Manufacturers, they made this Fifty-Seventh Illinois Dental Society meeting the best ever held in the "Windy City."

Dr. Martin Sends Message to Graduating Class of Royal College of Dental Surgeons

DR. Oliver Martin of Ottawa sent the following message to the graduating class of the Royal College of Dental Surgeons, in which there are over one hundred members this year:

TO THE GRADUATES

Gentlemen,—

You are about to leave College. The College has done its best—which is saying much—to fit you for the life work you have chosen. You also have done your best and most of you will be an honor and a credit to the school.

Whether you are aware of it or not, you will carry away in some measure the aspirations and ideals of your teachers, the impress of their personality will stimulate you to higher ideals.

Without an ideal advancement is impossible, but it is also quite possible to entertain a low standard of desire which tends to retrogression.

An ideal, then, is an ultimate object or aim, the highest of which is service. The Greatest Authority said: "I came not to be ministered unto but to minister."

Graduation is progressive. The ideal graduate is ever aspiring to more and better knowledge.

A splendid opportunity is afforded by the local and provincial dental society, these meetings are post-graduate courses in themselves, and by taking active interest you not only keep bright from contact with your confreres, but help to elevate the profession of dentistry and to fit yourselves for better service which the public is not slow to recognize and appreciate.

Ottawa, April 14, 1920.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

Error In X-Ray Diagnosis

W. H. Gilmour, L.D.S., M.D.S.. The Dental Record, Vol. XL., No. 4, Page 201.

AN illustration of some of the difficulties met with when reading radiographs is given. The patient, a boy of about fourteen years of age, received dental inspection and nothing of a serious nature noted. A few months later he complained of trouble about the anterior teeth. Examination showed a distinct pocket between the upper right central and lateral. There was also a discharge with a very foetid odour from between these teeth. Everything gave evidence that the pulps of both teeth were dead. Both teeth were opened up, drained, treated, and filled. The only evidence regarding the reason for the death of the pulps was that the boy had been hit in the mouth by a cricket ball some years previously. Nothing was done to the teeth at that time and no discomfort was manifest as the result of the accident except a bad taste caused by the discharge from the tissues and an occasional sickness which it induced.

Having obtained this history, the dentist began to doubt whether one or both of these teeth had been fractured, especially as a foetid discharge continued to come from between them even after the roots had been drained and filled. Clinically there was evidence to suppose this to be the case. The boy was sent to a radiographer, who reported that there was a fracture of the right central incisor with some evidence of absorption due to inflammation at its apex.

One of the prints showed an oblique line, starting from the left central towards the right central, then towards the right lateral region. The clinical evidence, the X-ray photographs, and the report of the radiographer confirmed the opinion that the right central was fractured; yet the dentist did not wish to remove the tooth on account of its important position. After an absence of a few months the boy returned for treatment and this time the dentist made an Z-ray examination with a view to finding out the length of the fractured portion and so determine the possibility of crowning the root. The same conditions were again observed and extraction was decided upon. When the tooth was removed it was not fractured at all, but was a solid central from incisal edge to apex. It was immediately treated, replanted in the socket and ligatured to the teeth on either side. The next day another radiograph was made with the tooth in place in order to learn if it had been properly replanted and it again showed the fracture, or what had been diagnosed as a fracture. Why?

There are two hypotheses to account for this radiographic evidence: (1) That union had taken place probably by the cementum, or (2) that the acute inflammation and suppuration at the time of the accident had destroyed the missing alveolus, which loss was greater towards the lateral, and that on partial recovery the chronic irritation had thickened the lower border of the same, leaving an oblique line, and that this difference in density had given rise to the delusion. "There is nothing more dangerous than that which seems obvious."

THE USE OF A WARM INVESTMENT IN RELATION TO CAST GOLD INLAYS.

E. F. Deck, D.D.S., The Commonwealth Dental Review, Vol. XVIII., *No. 3, Page 97.*

THE common practice with inlay preparation is to remove the wax pattern from the mouth at body temperature (98.6° F.) and invest it in material mixed with tap water, say at 60° F. or with water at room temperature, about 75° F.; in either case we have a mould formed about a very much contracted wax, and then, when this mould is heated to redness for casting, we get a still further contraction with many investments, so that the final gold inlay, with the inevitable contraction of the gold from the molten to the solid state, shows a very poor adaption in most compound cavities.

It is best to take advantage of the physical properties of expansion and contraction in wax according to temperature, and invest the wax pattern at approximately 110° F. This not only compensates for the contraction of the wax from the mouth temperature to room temperature, but it also expands the wax and gives an enlarged mould into which to cast the gold, with the result that we are able to neutralize almost completely the gold shrinkage.

The outfit used in this method is: A shallow saucepan about 6 inches in diameter which stands upon a tripod about 8 inches from the table. Two Bunsens are used, one to rapidly raise the water in the saucepan to 110° F., and the second, equipped with a needle regulating valve, to hold the temperature at that point, after the larger flame is turned out. Fixed quantities of water and investment material are always used.

The wax pattern is first painted with methylated spirits (or soapy water) using a sable brush for this purpose. Have the mixing bowl or glass, inlay ring, etc., ready in the warm water, then when uniform heat has been attained, quickly shake the powdered investment into the water and proceed to carefully cover the wax pattern with the investment.

Remove the inlay ring from the water and seal its base with a piece of vaselined glass. Quickly pour the remaining investment into the ring (down the sides) and gently push home the wax pattern. Place the ring back into the saucepan and keep at 110° F. until the investment has set hard. Then remove, place over suitable heat and slowly dry out. Increase the heat slowly until all the wax is smoking vigorously and the sides of the crucible are browned. At this stage the sides of the mould will have a very thin layer of carbon and if the inlay is cast at this time a very smooth surface will be obtained. If the investment is heated up too quickly and the wax allowed to bubble or steam is formed, the inlay will have a roughened surface and consequently be difficult to seat in the cavity.

Careful experimentation has shown that impression wax containing resin, tears up the surface of the investment and is ultimately deposited as a loose powder thus interfering with a good cast. There is a more marked interference with investment surfaces as you decrease the amount of plaster of Paris in the investment.

ANAESTHESIA RESEARCH

THE dental profession in earlier times did much to promote research along lines calculated to lessen the discomfort usually accompanying operations about the teeth. For some reason or other, unfortunately, dentists seem to be quite willing that this particular field for research be left to others; consequently we cannot claim credit for the introduction of many of the new methods now in use. One would not dare to say that we have entirely neglected this work, because that would not be true. But considering that all operations we do, or at least most of them, call for some form of an anaesthetic, it is surprising that greater progress has not been made. Undoubtedly this is our particular field and much is expected of us. What are we going to do about it?

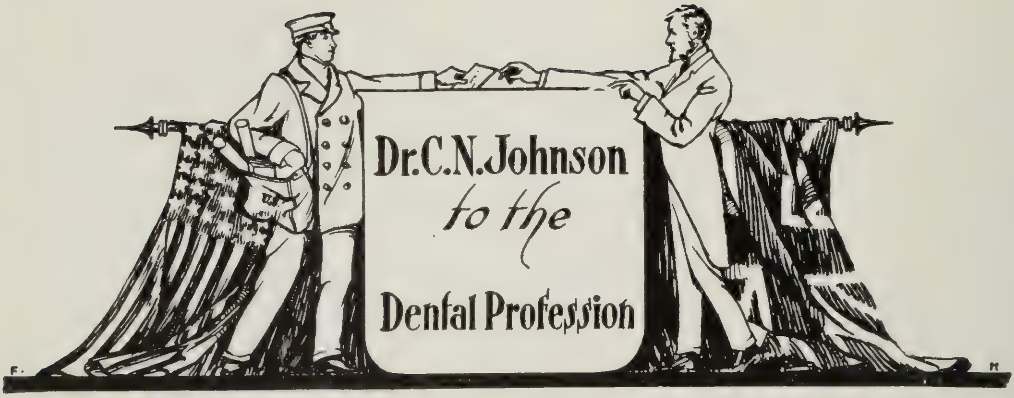
In the United States there has recently been launched "The National Anaesthesia Research Society," the purpose being to collect data and carry on original research in this department. The objects of this association are, as evidenced by the articles of incorporation, very extensive—"To promote the science of anaesthesia and to enable its members, after first having obtained the approval of the society, to submit without prejudice to the dental and medical profession, any views, findings, or accomplishments they have attained; to obtain from all available sources such information as is now extant concerning any material, liquid or gas, known to have anesthetic properties; to arrange, in co-operation with dental, medical and anaesthesia associations for the preparation and delivery of suitable interesting and educational papers on the general subject, or relative to some particular anaesthetic; to use influence to prevent the publication or circulation of any false or unauthentic statements concerning any and all conditions, symptoms, or phenomena prevailing during or after anaesthesia by any anaesthetic, and to prepare and distribute on request, forms on which such information can be tabulated with uniformity; to distribute by pamphlet or publication, as its funds may permit, and its governing powers authorize, such reliable data as it may collect or obtain through its members or others interested in the subject of anaesthesia, for use by the medical and dental professions; to co-operate with state authorities and other bodies in the preparation of suitable legislation to safe guard those to whom anaesthetics are administered as well as those called upon to administer them; to use its influence in every way and to give its aid towards the advancement of the Science of Anaesthesia."

If it is not deemed feasible to form such a society in Canada, any information regarding this subject should be forwarded on to the association mentioned above which is headed by F. H. McMechan, A.M., M.D. of Avon Lake, Ohio.

CALCIUM CHLORIDE AS A HAEMOSTATIC.

British Journal of Dental Science, Vol. LXIII., No. 1228, *Page* 101.

IN a case of persistent bleeding from the root of a tonsil after removal of the gland by guillotine, as ordinary means failed, the doctor injected a 1 in 4 solution of calcium chloride into the patient's buttocks. Eventually 8 to 10 gr. of the salt was given into the glutei muscles. The bleeding ceased in under two minutes, and did not recur until a week later. On this occasion 4 gr. were similarly injected with a similar cessation of the haemorrhage. We are not told whether the man was a true haemophile, but, although local measures for stopping the oozing failed, and as the bleeding is stated to have been venous, it is possible that in this case, at all events, the haemorrhage was local rather than diathetic. We learn, however, that similar procedure in the practice of other surgeons has proved successful, so it seems probable that the method should be useful in cases of persistent oozing after dental extractions.



Looking Defeat in the Face

DEFEAT comes to every one at times, to some more than others, but in some form at some time to every human being. The greatest achievement of life is to be able to look defeat in the face and smile. It is often so hard to do this—defeat is so bitter, and we resent it so stubbornly—and yet the man who has learned to do this has achieved greatness. There is a pat phrase which says "A good loser is a winner," and this is fundamentally and philosophically true. Even if the loser does not win over others, he surely does over himself, and this is the supreme attainment.

Most men permit a defeat to weaken them, whereas they should turn it into an element of strength. They should profit by every defeat through learning how to avoid the same kind of defeat again. Sitting and grieving over a defeat does not help, it is injurious in every way. If you are knocked down it is not logical to lie there and grovel in the dust. If there is any breath left in your body you should use it in getting on your feet again. Imitate the spirit of Pat, who in a very prolonged fight was getting much the worse of it. Seeing him badly beaten up, a friend said: "Pat, can't you see you're licked? Why don't you say 'enough' "? And Pat answered: "If I have strength left to say that, I'm not licked."

If a man yields to defeat he is defeated twice—first by the thing that defeated him and second by himself in yielding. By this it is not meant that he shall go on blindly contending against odds over which it is utterly impossible for him to prevail. It would be folly for a man to persistently force his shoulder against a heavy stone wall with the idea of ultimately pushing it over—the shoulder would suffer, not the wall. And the moment the fact is discovered that the wall is too strong for the shoulder the man should look his defeat in the face and proceed to find some other means of reducing the wall. If the wall must come down and the shoulder is not strong enough to move it, surely there are other forces at his command to accomplish his purpose. Surely he must not give up merely because his own puny strength does not suffice.

Failure by one method may result in a very much better way being discovered, and a defeat may thus be turned into a brilliant victory. The main thing is not to be downcast by defeat. The greatest men in the world have been defeated—some of them conspicuously so—but if really great, they have never permitted a defeat to dishearten them. When you and I are defeated let us think of some of these great men, and take fresh heart by their example. If they had been conquered by defeat we should never have heard of them, but they have gone on in the face of reverses, and have finally triumphed. So also may we if we have the manhood to persevere instead of moping and whimpering over our defeats.

The greatest courage is not manifest by going out on the field of battle and facing an enemy. This is magnificent, of course, and splendid in every way; but the real heroes of life are those who in the presence of defeat resolutely turn their faces toward the East and refuse to be conquered. It is the daily and hourly demand upon our resources, without the blare of trumpets, in the quiet of our own consciousness, that the greatest battles are fought and won. And the bravest man is he who shows courage when the world is not watching, when the fight is between hope and light on the one side, and despair and darkness on the other, when nothing but sheer determination can suffice to keep the head above the waters of despair, and when the fight must be made almost alone.

The sublimest courage of all is that which impels men to do the brave and manly thing in the presence of reverses, with no other hope of reward than the conviction in their own hearts that to yield is unmanly, and to give up a disgrace. Fight the battle with yourself and do not yield unless you are obliged to, but if obliged to yield try to do it gracefully and without resentment. Resentment never softens a defeat, but embitters it, and makes it more galling and unbearable. Profit by your defeats, and they will not have been in vain.

C. N. Johnson

* * *

ORAL HEALTH

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Vol. X. TORONTO, MAY, 1920 No. 5

EDITORIAL

Government Grant to Royal College of Dental Surgeons

THE Ontario Government has decided to give financial aid to the building programme of the Royal College of Dental Surgeons and $100,000 appears in the supplementary estimates for this purpose. The college, in enlarging its teaching facilities, has been largely actuated by a desire to meet the requirements of returned soldiers. Of 320 first-year students, 260 are returned men. In a total registration of 780, there are over 500 enlisted men, of whom 100 suffered disability. The Honorable R. H. Grant, Minister of Education, issued the following statement to the press:

"The new building and equipment cost $150,000, of which the college itself has paid $50,000. The work was not begun until after the whole problem had been laid before the Hon. Dr. Cody, and the building extension was undertaken with the full knowledge of the late Government. Had not the plans been proceeded with, the college would have been unable to receive one new student this year, the entire accommodation of the old building being barely sufficient for the students who had enlisted during their course and who were returning to complete their course. The seriousness of this situation may be appreciated when it is remembered that this institution is the only dental college in Ontario. This is the first request for funds ever made by this college, and it was for the Department of Education to determine whether assistance to dental education should be given direct to the college or through the universities. The Government has decided that it would be unwise to have a duplication of dental faculties in the Province, and that dental education will be best served by maintaining the present position of the Royal College of Dental Surgeons, which is now recognized as one of the foremost dental institutions in the world. Amendments to the Dentistry Act will be proposed at the present session, which will provide that the property of the college cannot be disposed of without the consent of the Lieutenant Governor-in-Council, and that the Minister of Education for the time being will be ex-officio a member of the board of directors."

The Royal College and the Dental profession are to be congratulated upon this very generous and whole-hearted public recognition of the growing importance of Dentistry and of its vital relationship to the health of the people.

The graduates of the College must feel a great sense of pride that their effort in establishing and administering a dental college dating back over the past fifty years, (without expense to the public throughout that whole period) should be officially recognized as a great public service.

The sympathetic and helpful attitude of the Honorable the Minister of Education of the Province of Ontario, of the Drury Cabinet and the members of the Legislature who supported this grant, is greatly appreciated by the entire dental profession of the Province.

The amendments referred to by the Honorable the Minister of Education, while giving public recognition to the College, will not in any way disturb the vested rights of the Dental profession nor will they remove from the profession its present responsibility for the proper administration of the College through the Board of Directors elected by the Licentiates of the Province.

Dental Practitioners and Boards of Education

THE following letter from Dr. E. E. Bruce, of Kincardine, is of general interest to the Profession, but will prove of special interest to public-spirited Dentists who have been serving the State as members of their local Board of Education:

Kincardine, Ont.,
April 17, 1920.

Dr. W. Seccombe, Editor "Oral Health, Toronto.

Dear Doctor Seccombe,—

It may interest your readers to know of a suit in the Dominion Court here this week, brought by myself against the father of a girl attending public school. During the dental examination for the survey, this child was given a slip notifying the parents of defects in five permanent teeth. The girl made an appointment and had work done at two different sittings. The father claims he never sent her to the office, but knew at end of the first sitting that work was proceeding, and never enquired as to who was responsible for payment. The child previously had work done by me, attending by appointment, exactly the same as this time.

Judgment was given for one-half my charge, because of my being a member of the local School Board. The Judge claimed that, as a member of such Board, I entered into a contract to examine the teeth of the scholars, and was therefore indirectly acting in a dual capacity.

The judgment is bringing about resignations from a number of members of the School Board, who cannot avoid doing some business with the Board. This judgment may be a literal interpretation of the law, but other Dentists in similar circumstances should be warned of the facts.

Yours sincerely,
(Signed) E. E. BRUCE.

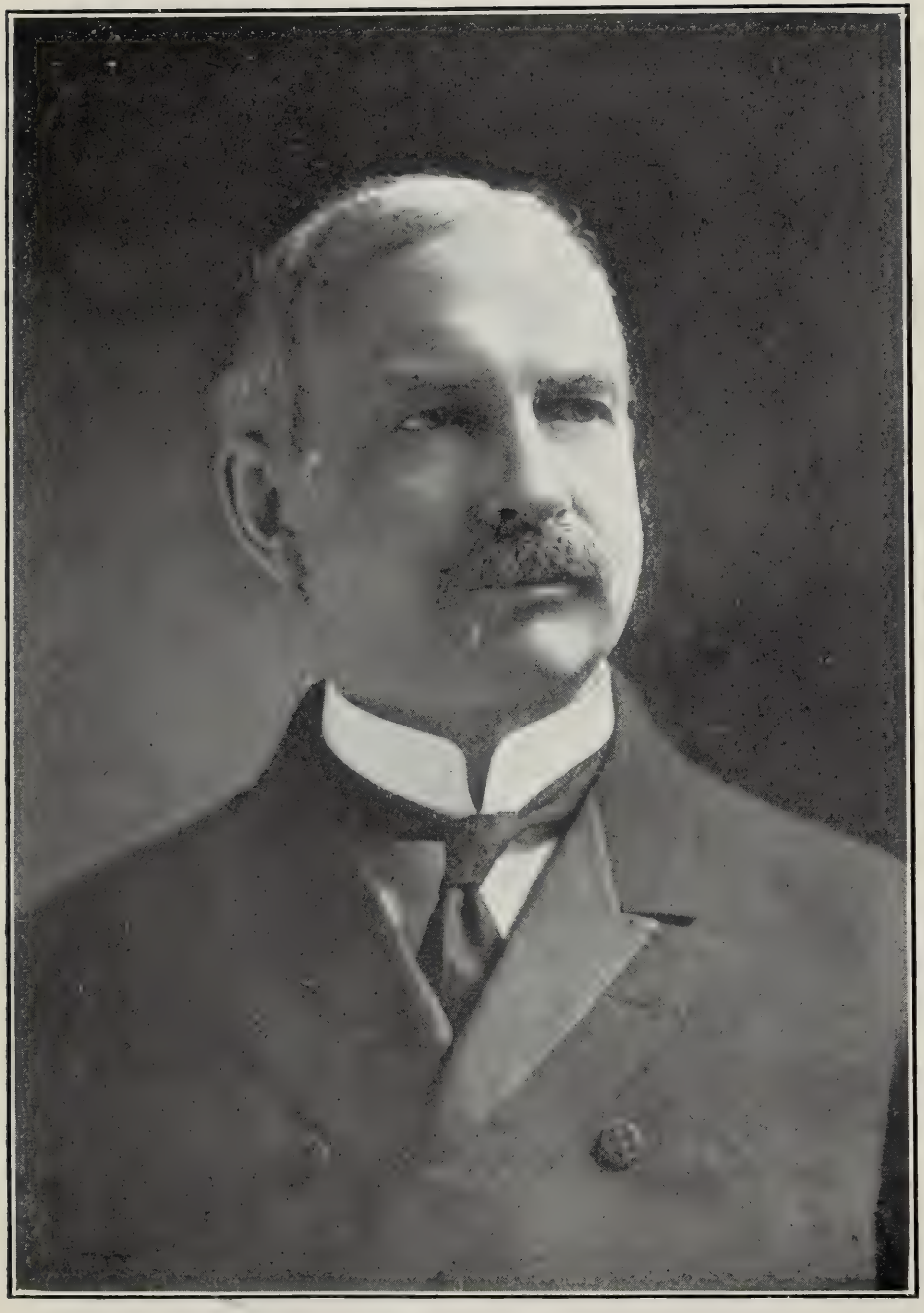
Hundreds of Dentists throughout Ontario have given their time gratuitously to the Provincial Department of Education, for the purpose of putting into effect a Province-wide survey of the teeth of the school children.

Should the court judgment referred to by Dr. Bruce stand, it would appear to make it practically impossible for any Medical or Dental practitioner to occupy a seat upon the local Board of Education, where such Board decides to carry on a systematic health examination and survey of the school children of the district. Should such interpretation prove to be the fact, an amendment to the Act will doubtless be made, as it was surely never intended that the organization of a school health service would deprive members of the Dental and Medical Professions of membership upon local Boards of Education. Certainly the public would not support such a policy.

ORAL HEALTH has drawn the attention of the Honorable the Minister of Education to the facts in this case, and was assured that the matter would receive most careful consideration.

WHY SOME GOLD FILLINGS BECOME LOOSE.—When a gold filling is subjected to the impact of mastication for a time, it will undoubtedly change its shape, so that the fillings in a good many teeth will become loose,—not because they are improperly shaped, not because the tooth has been improperly filled, but because of the impact brought to bear upon the gold. In time it is forced from position by means of a change in its shape.—(*W.H.T.*)

SELFISHNESS is the Greatest Curse of the Human Race.



C. N. Johnson, M.A., L.D.S., D.D.S.,
Chicago, Ill.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

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Address to Graduates Delivered at Convocation —Royal College of Dental Surgeons Toronto, 7th May, 1920

BY C. N. JOHNSON, M.A., L.D.S., D.D.S.

MR. Chancellor, Members of the Board, Members of the Faculty, Fellow-Members of the Dental Profession, Ladies and Gentlemen:—

It is a very great pleasure, I assure you, to be here on this occasion. It is always a pleasure for me to come back to Toronto, and to Ontario, and I am especially pleased on this occasion because of the nature of the exercises of the week. I feel as much at home on the streets of Toronto as I do on the streets of Chicago,—I feel probably a little bit *safer* on the streets of Toronto than on the streets of Chicago. I love Toronto,—and, ladies and gentlemen, I love Chicago!

The first thing I enquire about when I go to a city is the nationality of the police. I wonder if the boys of Toronto know anything about that? When I make a guess, I hardly ever make a mistake,—I always guess the same nationality! That stood me in good stead about a year ago, in Chicago, during the strike when streetcars and elevated roads were tied up. We have about half a million automobiles registered in the State of Illinois, and I believe they were all on the streets of Chicago at that time. I undertook to drive downtown. They took all the regular police off and put on a new lot of traffic policemen, but they selected the same nationality that we have ordinarily in our police force! I guessed that. Driving down the street, I bumped into a Ford, which was ignominy enough in itself, but what was worse, the traffic cop (or I suppose I should say "traffic policeman") caught me at it. He said "What's the matter with you anyway, do you think you're the only guy on the street? I've a good mind to run you in. What's your name?" I said, "Officer, my name is Casey." "Casey! How do you spell it?" said he. "C-a-s-e-y," I obligingly replied. "Say, Casey," said he, "don't it beat everything the way those Flivvers get in the way of automobiles?"

I have been trying for a long time to get away to England, with the object of telling them over there how to pay the national debt of England. I heard how it could be done: Just give Ireland her freedom, and then the British Government reserve the moving picture rights! I have been trying to get away, to take that message to Lloyd George; but since arriving in Toronto another idea has come to me. Instead of taking that message to the Exchequer of the British Government, I would just refer them to the Management of the Royal College of Dental Surgeons of Ontario, who could go to the Legislature of this Province and get a grant of $100,000! I congratulate them on that. It is an acknowledgment of the dignity and importance of this Profession of ours, more significant than anything that has occurred in years, and I heartily congratulate the Management of the College on such an achievement. I am confident that the Legislature of this Province will never regret their action, but will find it money well spent.

You young men are to be congratulated on entering the Profession at this time. There is no system of Dental education,—no system of general education,—that is absolutely ideal, but the system in vogue in Ontario to-day is more nearly ideal than that existing in any other place, which is a very important factor in the development of Dentistry in this country. I congratulate you young men on coming into the Profession under those auspices. I bid you welcome to this Profession of ours, which we believe to be one of the most important in existence to-day.

You are coming into the Profession, also, at a period which is significant in its history all over the world. Dentistry never before held the place that it does to-day.

Referring for a moment, if I may, to the other side of the line,—though I dislike that word; I don't like to think of the "line" at all; the line between Canada and the United States is merely an imaginary one. Something happened during the war which has bound these countries together as they never were bound before, when the boys under the Union Jack marched side by side with the boys under the Stars and Stripes. In 1917 the United States Congress passed legislation which placed Dentistry in the army on an equal with the other Professions. It has given to us an elevated position in the eyes of the people, but at the same time it places upon us the most serious responsibility. If the Government of the United States or of Canada, has such confidence in Dentistry as is evidenced from the action of the Legislatures, then it is up to us to maintain the honor and dignity of the Profession so that they will never be sorry that they have legislated in our favor.

You have come into the Profession at a time when you can hold your heads higher than Dentists have ever been able to hold them before. I congratulate you. Live up to your opportunity!

Our Chancellor referred to the fact that you stood equal with Dentists of any other country,—even to the size of your fees; but the Chancellor apparently never had any work done abroad. We do not know how to charge fees in this country and the United States; we have not learned even the A. B. C.'s of it yet!

You come into the Profession when the emoluments are greater than they ever were,—when the people appreciate Dentistry as they have never done in the past, and when you will be rewarded not only in a financial way, but have a status such as no body of young men ever had before.

Yet there is another tendency of the day to which I wish to call your attention,—a tendency which, if it continues, threatens to injure the Profession, and which I hope you will avoid. There is, in common with the general upset condition of affairs, a tendency to take advantage of high prices,—take advantage of situations which under ordinary conditions no professional man would take advantage of. There is a tendency to exploit the people. In order to bring that lesson home to you in the clearest possible way, I am going to take the liberty of reciting to you some things that have happened under my own observation. Let us hope these things do not happen in Toronto, but I do know that they have happened in the vicinity in which I practise.

In the city of Chicago, I had a patient for some years,—a very delightful patient, (which means, of course, that she was a young lady!) and I took a great deal of pride in the care of her teeth. I was able to have her mouth placed in what I considered an excellent condition. In the course of events she married and went to another city, but she would come back to Chicago at intervals, and would come and let me see what condition her teeth were in. Some months ago she had a baby, and was unable to come to Chicago, during which time she had the misfortune to break a piece off a lower molar which carried an inlay. She went to a local dentist, who looked her teeth over and immediately advised her to have an X-ray. Ladies and gentlemen, there was not a pulpless tooth in her mouth, and no need of an X-ray. That Dentist said, "Your teeth are in such bad condition that you will have to come to me an hour a day for two months, before they can be put into satisfactory shape." She was naturally very much alarmed. Her husband wired to see if I would care for her teeth, and I wired back that I would. She came to Chicago. There were just four small fillings, besides the broken tooth. It took five sittings to put her mouth in good condition, and then she told me this story. Now, why did that man give her such a report on the state of her mouth? Simply because he knew she had lots of money and could afford to pay a big fee!

Here is another case: A gentleman in Chicago had been ordered to have all teeth taken out,—which is not very rare these days,—because he was not well and the physician could not find any other reason to account for it. The X-ray man diagnosed his case and sent him to a dentist, who said his teeth had to come out. He was very much depressed and finally, after consulting different practitioners, was sent to me. When this man told me this story, I said, "How much do you value your teeth?"—because I saw he had not been caring for them very well. He replied that he would rather have his left hand taken off than lose his teeth. He wanted to show me the written diagnosis of what the dentist had said, but I told him he didn't need to,—that I could repeat it myself almost word for word,—because I have seen many statements of the same kind from the same man! I called up the physician, who stated that he had gone entirely on what the dentist said. I asked him to make a very careful investigation and not to order those teeth out, because I did not see the necessity for extraction. Finally, after many consultations, the man wrote me saying "I have just had a culture taken of the fluids of my mouth, and if they find streptococci there I will let you know." I was just leaving the city at the time, but wrote him that I predicted they would find streptococci, because they can find them in the fluids of any mouth. The man who was wise enough to take a culture was wise enough to know that too, and was playing on the fears of his patient. We all make mistakes, but I do not want to see people stampeded out of common sense. I am not minimizing in the slightest degree the possibilities of serious trouble from infected mouth conditions; but many of our Profession, and also the X-ray man, are using their knowledge to frighten patients unnecessarily. This is the worst perfidy of all, and I warn you young men against it.

I want to predict that you will encounter fads from the first days of your Professional work. Not that I entirely object to fads,—we must have something to stir us up at times; we must make progress; but when fads do injustice to the patient, we must guard against them.

If you practise your Profession honorably, you will not have to resort to the things I have mentioned, that have happened in my locality, to get patients; there is more work waiting for you than you can possibly take care of.

I would not minimize the material reward that you will derive from your Professional efforts. I had the pleasure of being driven around the streets of Toronto this afternoon, and seeing many beautiful homes owned by dentists, and I was greatly pleased. I want to see my Profession liberally rewarded, because nobody knows better than I do the sacrifices a professional man makes. But there is a better reward than that of dollars and cents.

One night after twelve o'clock, I was called by the 'phone, told one of my patients was suffering terribly, and asked if I would come and see if I could do anything for her. It was a long way, but they sent a cab for me and I went. I found an ex-Mayor of Chicago pacing the floor himself, on account of the suffering of his wife. She was sitting up in bed, and the pain was so severe that she told me she was afraid she was losing her mind. I went to work as best I could. I don't need to bring before you, a professional body of men, the means I took for obtaining relief, but within fifteen minutes the patient began to relax, and in another ten had dropped off to sleep. The change in her face from the drawn look of agony to that of repose repaid me for hours and weeks and years of study, and condoned in a measure all the mistakes I had ever made. I went home, and the report came next morning that she had slept the night through. I couldn't tell you the amount of money I made that day, or the days before or the days following, but as long as I live that woman's face will remain with me as one of the best rewards I could ever get from professional effort. It is a great comfort to quiet pain, and it should be our pride that we are permitted at times to relieve the suffering of our fellow-man.

I have said that your professional reward will come in other ways than from money. I am going to make an acknowledgment. Some of the very best energy and time of my life have been spent in recent years without a penny of recompense. I have gone before the medical profession a good deal, and have protested on the snap judgment whereby so many teeth have been ordered out of patients' mouths. Some of the profession have got into the habit of sending patients to my office with X-rays in their hands. Sometimes when I see a patient coming in with an X-ray, I am sorry X-rays were ever invented, and then the next moment I am glad, because they can do so much good. I see written on the diagnoses by the X-ray men some strange terms, and the patients come to me in fear because of these terms. I look the cases over. I used to be very diplomatic, and try to shield my professional brothers, but lately I am blunt enough to say "I don't agree with him at all. Go and tell him so." I do not charge patients a fee for that. I believe every patient who comes into your office should have an appreciation of dental service, and know that it is worthy of a fee; but they go to a medical man, who charges them a fee; the physician sends them to an X-ray man, and he charges them a fee; he in turn sends them back to the physician, who then sends them to me, and if I charge them a fee and send them back to their own dentist, he in all probability charges them another fee. Some of them, of course, are rich, but others are poor, and they naturally come to the conclusion that it is a regular chain of fees; and I am going to take a link out of that chain, if possible. At the same time, I do not wish to encourage the idea that professional men are in the habit of rendering service for nothing, so usually explain that I do it as a professional courtesy to their physician or their dentist. Sometimes I even tell a fib, by saying that I think a great deal of Doctor So-and-So, and am glad to do it for him—even when I never saw or heard of Doctor So-and-So. But I love the members of my profession, whether I have seen and known them or not. I simply want to do something to let those poor people feel that a fee is not taken from them in every office to which they go. I have been criticized for this, ladies and gentlemen, again and again; but I am willing to take that kind of criticism, in the effort in my heart of hearts to keep the reputation of my profession unstained.

When the time comes that dentists think more of the money they make than of the service they render; when they expend their energy in exploiting the people rather than conserving their welfare; when they exalt the God of Mammon above the Divinity of Service; when the sordid and selfish shall assume the ascendency over the sublimity of sacrifice, then shall this profession of ours sink into the nethermost depths of degradation, and we shall be known as men not worthy of professional status, not fit to associate with those of culture and refinement, not even entitled to a place beside the common day laborer, because we have besmirched our calling and betrayed a trust reposed in us by the sturdy old pioneers of the days gone by, who, by their devotion and self-sacrifice, have handed down to us a profession of high ideals, whereby we were enjoined to serve humanity in an honorable way, rather than to use our calling as a cloak to impose upon the people.

Gentlemen, it remains for you and for me to choose whether we shall exalt commercialism above professionalism, or whether we as professional practitioners shall so conduct our affairs that, while reaping a legitimate material reward, we may be able to look every man in the face and not hang our heads in shame.

I feel a personal interest in every one of you men. Your College is my Alma Mater. I was graduated in 1881, under a different environment from what you are enjoying to-day, but when I look back and remember the men who taught me, I have as high a reverence for those men as you could possibly have for those who have taught you. Whenever the name of Dean Willmott is mentioned in your presence, take off your hats. I remember also the names of Dr. W. T. Stuart and the late Professor Teskey. As I have stated before in print, one of the greatest lectures I ever heard as a student was by Dr. Luke Teskey, and I said at the time that if I ever lived to hold an audience of boys as he did, I should be very proud of it. I look back over those old days and see a big difference in the environment and equipment. I was educated in a little corner room at Shuter and Bond Streets—so small that you could almost put it in your vest pocket. When I see the beautiful rooms of the present College Buildings I am proud of the progress made.

Boys, if at any time in your future careers I may be of service to you in any capacity, just come to me as to a fellow Alumnus, not as to an older man, because I hope I will always be a boy. If you meet me at Dental Societies,—and I hope I will meet you at many,—identify yourselves. Come and shake me by the hand. I will always welcome you.

Again I congratulate you. I wish you the greatest success that any body of men can have, and I wish you happiness as long as you live.

Teeth and the Worker

JAMES BURNET, M.A., M.D., CH.B., M.R.C.P. (EDIN.)

LECTURER ON MATERIA MEDICA AND PHARMACY, PHYSICIAN FOR DISEASES OF INFANTS AND CHILDREN, AND IN CHARGE OF THE CHILD WELFARE CLINIC AT THE MARSHALL STREET DISPENSARY, EDINBURGH.

(The establishment of Industrial Dental Clinics in connection with the larger industries of the country is an important problem now confronting the Dental Profession, and requiring early attention. The wise and humanitarian solution of this problem will without doubt have historic effect upon the future attitude of Government and official bodies toward the Profession of Dentistry. Whether that attitude will be antagonistic, or one of sympathy and friendship, will depend upon Dentistry itself,—upon whether the Profession recognizes its full public duty or concerns itself primarily with what it may conceive to be its own affairs. Dr. Burnet has given the whole problem of Industrial Dentistry a great deal of thought and this paper, which recently appeared in The Journal of Industrial Hygiene, will doubtless be read with much interest.—Editor.)

THE importance of good teeth cannot be overestimated. In this connection prophylaxis is vastly superior to any curative measures which may be adopted once the teeth begin to show signs of decay. Carious teeth are always a source of ill health. Such conditions as alveolar abcess, enlarged cervical glands which may eventually become tuberculous, inflammatory affections of the throat, eye troubles, pernicious anaemia, arthritic disease, and conditions due to septic absorption may all be caused by the presence of unhealthy teeth. In fact, there is no limit to the conditions which may arise to threaten the health of the individual when the teeth begin to show signs of decay. Bad teeth eventually lead to imperfect mastication, and this, in turn, causes indigestion which produces malnutrition with all its attendant consequences, such as anaemia, general feebleness, lack of energy, drowsiness by day and sleeplessness at night, headaches, depression of spirits, and so on. Such conditions do not make for strength on the part of the worker whose health becomes more and more impaired as a result. It is true that in certain cases the individual has a store of reserve energy on which he can fall back, but this is by no means always the case. In the average worker bad teeth mean impaired health and loss of work or diminished output. It is, therefore, of the utmost importance that in all welfare work we must not lose sight of the value of healthy teeth to the worker, whatever his or her age may be.

Let us first of all consider what are the conditions of the juvenile worker at the present time. My experience in the examination of young persons of factory age, that is, over 14 and, say, under 16, is interesting. Out of 10,000 boys and girls between the ages of 14 and 16 years, whom I examined in factories and workshops for the Home Office during the past few years, I have found a very small percentage with perfect teeth. Even where the teeth are obviously carious, no attempt, in many instances, has been made to deal with them during school age. Some of those who had very good teeth admitted that they either never brushed them at all or did so at very irregular intervals. In fact, I am inclined to think that many dentifrices now sold to the public may be actually injurious to the teeth if applied too frequently. In some cases the teeth were in a very bad condition indeed, and the health of the young person was obviously impaired.

Inquiry has proved that bad teeth in young persons are due to one or another of the following causes:

THE TAKING OF MEDICINES IN EARLY CHILDHOOD.

1. The working classes are constantly drugging their children with such remedies as grey powder, chemical food and other mixtures containing iron, as well as patent cough mixtures, all of which tend in time to destroy the teeth. This custom is fostered by free hospital advice and medicine. Very often children attend a hospital or dispensary long after it is necessary, and continue swallowing tonic mixtures and "cough bottles" which can only do harm.

THE USE OF SWEETS AND CHOCOLATES.

2. During the war it was a notorious fact that the largest consumption of confections was by the working classes. Women and children greedily ate up all they could get, irrespective of the cost. Now that the war is over the same thing goes on. The result is that the teeth become markedly affected. Sugar is good as a fat producer, but it is extremely bad for the teeth.

CIGARETTE SMOKING.

3. This habit was prevalent amongst school-children during the war, but it has become much more common since. It is quite common to see boys of 10 years smoking cigarettes, while in factories it is quite unusual to find a boy who does not smoke. Unfortunately, the kind of cigarettes smoked is of a very poor quality.

NEGLECT OF CLEANLINESS.

4. The use of a tooth brush is by no means common amongst children. Even when they do brush their teeth, they are apt to do so at very irregular intervals. Again, many of the dentifrices in use are harmful if applied too frequently.

These, then, are some of the more important causes of bad teeth in young persons of factory age. They are all remediable, as we shall point out later on, by very simple means.

In adult workers the condition of the teeth is, so far as my experience goes, even worse than in the juveniles. In other words, the harvest of neglect in youth begins to be reaped when manhood and womanhood are attained. During the war I examined a number of women who were seeking government appointments. These women were drawn from all classes of the community. A large proportion belonged to the domestic servant group. Amongst these it was rare to meet with really good teeth. Many wore artificial sets, while a minority had had the carious teeth extracted before examination. In the majority of instances, however, the teeth were defective and some had even to be rejected on that account. It is well known that domestic servants are specially liable to suffer from indigestion and other stomach troubles. It is little wonder, when we bear in mind how many of this class have defective teeth. But domestic servants are only one group of female workers. The same thing I found to be the case in factory girls, tailors' machinists, and perhaps to a less extent in typists and clerkesses. All female workers examined displayed, as a whole, a very low standard as regards the condition of the teeth.

In male workers conditions are extraordinarily bad. Out of 200 men recently examined, I did not find ten who had what one could term satisfactory teeth. Pyorrhea alveolaris was extremely common. In many cases there was recession of the gums, and tartar-covered teeth. Several workers had only a few stumps left, and these were carious. It is a remarkable fact, whether related to the condition of the teeth or not I am not prepared to say, that many of these 200 male workers had thickened arteries. Certainly the condition of the teeth is striking and instructive. It is hardly conceivable that I had discovered a special group of men. Rather, I think, we may take it that all male workers have more or less defective teeth.

If my contention that the teeth of the worker, male and female, juvenile and adult, are to-day in a very bad condition, then surely it is our duty to do something to rectify this state of matters in view of the facts that bad teeth have a most disastrous influence on the health of the worker and that they may even produce disease which may interfere with his work. Bad teeth may, therefore, prove to be a cause of lessened production. Accordingly, both from the worker's and the employer's point of view, as well as in the national interests, it is our duty to attend to the teeth of the worker.

What steps are to be taken in order to improve the condition of the teeth in the worker? At the very outset, prevention is best; prophylactic measures must be taken. In fact, much of the machinery for this exists, but it needs oiling. The school authority in every district should see to it that no boy or girl leaves school without having had the teeth attended to by a qualified dental surgeon. So far as my experience goes, parents are often to blame for not carrying out the suggestions of the school medical officer as regards their children's teeth. It is their bounden duty, however, to give every heed to this matter, and no stone should be left unturned to secure that such be the case. It is often too late when the young person enters a factory to have the teeth seen to. They may be beyond the reach of mere preventive measures then, and only extraction is possible. My contention is, therefore, that if a child has his teeth or her teeth attended to during school life there will be, in due time, a remarkable improvement in the condition of the teeth of the worker. This, therefore, is the first step in the ladder of progress towards the goal at which we aim.

When we find a boy or girl of factory age with defective teeth, what is to be done? At present all we can do is to recommend the young person to tell his parents that the teeth should receive attention. This, I fear, is a measure of practically no value whatever; even if the parents are told, they will turn a deaf ear to the advice thus proffered them gratuitously. What I think is wanted is legislation on the subject. It should be made compulsory by law that no boy or girl who is considered by the factory surgeon to have defective teeth should be allowed to commence work until such time as a certificate has been granted by a dental surgeon that the teeth have been thoroughly treated. The importance of looking after their children's teeth would thus be impressed on parents, who would probably, from this cause alone, cease to neglect the advice of the school medical officer. In this way the law made to regulate the condition of the factory worker's teeth would very soon cease to be actually necessary, although it would still remain as a safeguard against neglect.

In some of the larger factories, especially in those which employ a welfare worker, the teeth of every young person are attended to as soon as the worker is engaged. In some cases this is done at the instigation of the factory surgeon, but in many instances the young person is taken by the welfare supervisor to a dental surgeon for his advice. In our opinion, every factory employing 1,000 workers or more should have a medical man on its staff whose advice is available in case of need. Naturally, the local factory surgeon, who is fully acquainted with factory conditions, is the most suitable man for such work. Such factories should also have a dental surgeon, who would co-operate with the factory surgeon, and who should be paid either a fixed annual salary or receive so much on account of each worker employed. Smaller factories might combine for this purpose, and share a medical man and dental surgeon between them.

Cigarette smoking amongst boys should be prohibited by law, and fines ought to be inflicted on boys who continue to disregard the injunction. No boy should be allowed to smoke before the age of 18. I am aware that there are certain restrictions regarding smoking amongst children of school age, but this is evidently a dead letter, as I have seen boys coming out of school lighting cigarettes under the eye of a passing policeman! What we want, and must insist on having, is a law which shall be obeyed and provisions of which will be carried out by those concerned. Cigarette smoking is not only bad for the teeth, but it checks growth and retards gain in weight. I find that boys who smoke are pale, undersized, suffer from giddiness and loss of appetite, and usually have carious teeth.

So far as adults are concerned, a system of regular inspection of workers in factories is necessary. In this article I am only dealing with the teeth of the worker, but eyesight, hearing and conditions of the circulatory and respiratory systems also demand attention. I maintain that every large factory should have a system of regular medical inspection of the employees, and smaller factories could easily combine for this purpose. It must often happen that workers suffering from curable diseases go on working until it is too late, quite oblivious to the fact that they are unfit. Much might be done, therefore, by securing the services of a medical man acquainted with factory life and the conditions of factory labor. One of his first duties would be to advise the worker to attend to his teeth, if they are found to be defective. It is one thing, however, to advise; it is quite another to get the worker to carry out your advice. If, however, there existed suitable machinery at the factory for attending to the teeth, much of the difficulty would be removed. At large works, therefore, a dental surgeon should attend as often as may be necessary in order to treat the dental defects of the workers, who would soon become reconciled to the new order of things when one or two of their companions had submitted themselves to the ordeal.

Much of the money that has been and will be wasted in administering the National Health Insurance Act might be diverted to subsidizing the medical and dental supervision of factory workers. This is a preventive measure which should appeal to that newly constituted body, the Ministry of Health. We can only expect good work when we have really good workers. We can only have good workers when they are healthy and are *kept* in a healthy condition. To secure this, one of the first measures, we take it, is to attend to the teeth of the worker. This is a national duty which the state, that is, the income tax payer, should see to. By curtailing unnecessary expenses in the various departments connected with the nation's health, and by thus liberating money enough to pay for Medical and Dental supervision of factory workers, great benefit would result. It is sad to think that so much money has been squandered during the war, money which would have sufficed to provide the whole country for years to come with well-paid medical men and dental surgeons. As it is, we have the government contracting for a few shillings a year, in return for which medical men in its service are called upon to treat the worker. Little wonder that we are a C-3 nation! All this must be changed. The Ministry of Health will not bring about such reforms as we have suggested. The employer, however, has it in his power. He is the man who finances the state, and it is to him that the state must look for its very existence. A strong representation made by employers of labor throughout the country could bring about the needed reforms in a very short time.

The health of the worker in the factory must be attended to. So far little has been done in this direction. The appointment of welfare supervisors is a step forward, but it stops short of what we must aim at. The workers themselves usually welcome reforms when these are found to be of practical and personal benefit. I am satisfied that it would not take long for them to discover that measures taken to improve the condition of their teeth were helpful in giving them better health. The worker to-day is not so shortsighted as to overlook the advantages of reforms made in his interests. Such reforms as we have suggested are badly needed at the present time, and in bringing them before the notice of employers and others interested we feel that we are opening a door which hitherto has remained closed.

Canadian Dental Research Foundation

AT the last meeting of the Canadian Dental Association, 1918, a Committee was appointed to organize Dental Research through the official Dental Boards of the Provinces of Canada and other Dental Associations, and to solicit subscriptions for organized research work.

The Committee, in co-operation with the Canadian Dental Association, decided that a fund of $100,000 should be established as a permanent Memorial to Dentistry's part in the war, and that the members of the Dental Profession be asked to contribute $50,000 of this sum, and public-minded citizens the balance.

The Committee determined that it would be in the best interests of the Foundation to appoint a regular Trust Company to receive and hold all contributions as a trust fund, the interest only being available for current expenditures. The National Trust Company have been appointed to act as trustees, and all moneys received by the Committee to date, amounting to $5,942.53, have been turned over to the Trust Company and placed to the credit of the Canadian Dental Research Foundation.

Plans are being perfected whereby every Dentist in Canada will be asked to contribute to this Foundation, and it is hoped that every member of the Profession will avail himself of this opportunity of thus becoming a member of this Canadian National Research body.

There will be little difficulty in raising $50,000 from the laity, if the members of the Profession do their part and generously support this fund. A member of the Committee has already received an unsolicited subscription of $25.00 from a business man who happened to hear of the establishment of the Foundation. Surely this should be a stimulus to those who are more familiar with the pressing need and great advantage that will accrue to humanity as a result of Dental Research.

There are many unsolved problems in Dentistry, such as Relation of Diet to Dental Disease; Root Canal Technique; Chemistry of the Saliva; Bacteriological studies in gingivitis; Tissue changes in dental foci of infection; Operative and Prosthetic problems, all having a direct bearing on daily practice.

The attention of the public is focussed on Dentistry as never before. Surely, if we desire to merit their esteem, we must rise to the opportunity and contribute to this worthy object.

The governing body of the Foundation will be most representative, made up of two members from each Province, elected by the Provincial Research Committee, which Committee will be appointed by the Provincial Dental Board.

All contributions should be addressed to Dr. E. A. Grant, Associate Secretary-Treasurer, 229 College Street, Toronto. Make all cheques payable to The National Trust Company for Canadian Dental Research Foundation.

The following subscriptions have been received to date:—

Dr. W. B. Amy	$ 100.00
Dr. I. H. Ante	25.00
Dr. W. A. Black	50.00
Dr. L. H. Boyle	10.00
Dr. A. B. Babcock	20.00
Dr. T. E. Ball, Harriston, Ont.	10.00
Dr. T. E. C. Butler	50.00
Dr. J. A. Bothwell, Stratford	25.00
Dr. F Cole	5.00
Dr. Harold Clark	100.00
Dr. J. A. Bothwell, Toronto	25.00
Dr. F. J. Conboy	125.00
Dr. W. H. Coon	100.00
Dr. W. L. Chalmers	20.00
Dr. C. R. Collard	50.00
Dr. G. H. Coram	25.00
Dr. J. W. Coram	50.00
Dr. C. A. Corrigan	25.00
Dr. T. Cowling	25.00
Dr. W. E. Cummer	50.00
Dr. J. Duff	10.00
Dr. L. Drew-Brook	10.00
Dental Hockey Club—1917	1,877.53
Dr. H. E. Eaton	100.00
Dr. B. O. Fife	25.00
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Mouth Conditions and Mouth Drainage*

By George D. Culver, M.D.

INTRODUCTION.

THE choice of title may be ambiguous and may need some explanation. Briefly, it is meant to imply only a small part of what might be considered under such a heading, for the mouth is not a thing alone, it is a multiplicity of extremely important structures, intimately linked with the whole body mechanism.

I know of no part of the body that can present more puzzling problems to both physicians and dentists, and at the same time, present solutions to so many enigmas in the way of diagnosis and treatment.

When a student in medicine, during a summer vacation, I had an opportunity to observe a clever veterinarian, who, in examining a horse, never failed to carefully inspect the mouth, whatever the apparent illness. It struck me that if helpful information could be obtained from the mouth of a horse, why not from the human mouth as well? I mentally compared his method with that of the physicians of that time who seemed quite satisfied with looking at the tongue, protruded as far out of the oral cavity as possible. Only the throat man looked inside and there must be some definite complaint of trouble before this occurred. It must be admitted that those of your own profession were not greatly interested in much within the buccal cavity outside of the teeth. That is certainly not true of the dentist of the present, but unfortunately, there are still many physicians who seldom carefully examine the mouth. In the field of skin diseases we find it as important to carefully inspect the inner skin as the outer, and the mouth opens up many surprises.

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*Read before the San Francisco District Dental Society, December 22, 1919.

In the consideration of mouth condition I should like to dwell upon those affections that would interest you most, but in thinking over the subject, I find myself picturing those things of greatest interest to myself. So frequently, an early diagnosis may be a life saver, and perhaps there is not any part of the body of greater importance in this respect than the mouth. I mention this aspect as you in your work have so much greater an opportunity to observe early lesions than do physicians, as it is the tendency of the majority of patients to procrastinate. This is especially true in regard to malignancy.

DEGENERATIVE GROWTHS.

No doubt malignancy and syphilis hold the greatest interest, and these may be puzzling enough, still you must often be confronted with other conditions that have a bearing upon your work. Any indurated, resistantly hard growth within the mouth that is not cystic, must be considered as possibly malignant or syphilitic until proven otherwise, and any sodden, excoriated area or ulceration must be looked upon with suspicion. Unusual manifestations so frequently sidetrack us, and that is just what one should wish to avoid. Tubercular ulcerations are not as common in the mouth as syphilis and cancer, yet they may occur and it may be difficult to make a diagnosis. Because a chancre occurs upon the gum and is wide spread, as it is likely to be, it is not an excuse for the removal of all the teeth on that jaw. I have seen that occur and it was not the fault of the dentist, as he was doing only that which was requested by the patient's physician.

One has to minutely observe the white patches that occur on the mucous membranes of the mouth, often extending on to the gums, in such diseases as lichen planus, lupus erythematosus, erythema multiform, and the leucoplakia of syphilis, to distinguish one from the other, and only the specialist in skin diseases is condemned if he doesn't make a diagnosis. However, the importance of leucoplakia should not be underestimated as so frequently it is indicative of an unrecognized or insufficiently treated syphilis, and the leucoplakia of the incessant smoker may be the forerunner of a cancer. The patient may not even be conscious of the fact that white patches of any sort are present and it is only justice to him that he be told of their possible seriousness.

I have seen in the mouth an exact replica of what, on the outer surface, we call granuloma pyogenicum. I should be greatly interested to know how you have classified the condition, as it is only in very recent years that its character has been understood by the dermatologist or surgeon. As a rule it presents itself as a dark reddish spongy tumor of exuberant granulations, and when in the mouth is most frequently situated at the margin of the gums or in the space where a tooth was removed. On careful examination it is found to have a pedicle, and on removal, a central, profusely bleeding, small spurter appears. Some question has arisen as to its causation, whether or not it is purely infective or largely mechanical in its origin. It would seem most likely that it is a natural effort to build a barrier over an exposed blood vessel, and that whatever infection is present is secondary. Its importance lies in the marked similarity to a sarcoma. The first one I saw was on the thumb, and it was diagnosed as a sarcoma, which it resembled in every respect excepting the pedicle.

A warning which we should all heed, and which I often repeat to myself, is that malignancy begins microscopically, and when first perceptible to the ordinary sense of sight, or that of touch, is very small indeed and, as a rule, has not metastasized and involved any of the regional lymphatic glands. If it can be recognized as such and immediately wiped out, it means a very different prognosis than usually has to be given in mouth cancer.

GINGIVITIS.

One of the most interesting things to me about the mouth is the frequency with which one sees gingivitis associated with skin eruptions. If I may be permitted I should like to say a word about inflammation of the gums from a little different approach than is the general rule. There is a point of observation not considered in literature on medicine or dentistry. It is that of mucous membrane congestion in general, associated with a few special locations quite noticeably changed. Has your attention ever been attracted to the flaming red lower lip, often seen in anemic young people, and the red tip of the tongue associated with bluish red, congested gums? Doesn't it indicate more than a local process in the gums themselves?

This aspect of gingivitis need not lead one away from the notion that infective micro-organisms produce the condition, influenced by local irritation from defects upon the teeth, but it should stimulate the hypothesis that the bacteria may not be the only fault, and that some disturbance is taking place within the body mechanism sufficiently great to result not only in an inflammation of the gums, but of other areas of the mucous membrane as well. So many parasites are hanging around all the time that one does not wonder that they jump at the least opportunity to get a foothold. So, when through anemia, or plethora even, the resistance is lowered, a suitable soil is prepared and the ever-present parasites begin their work of multiplication of themselves and destruction of tissue. A vicious circle is begun which is stopped only by hitting at the very source.

Many members of your profession recognize the close relationship of gingivitis to general systemic disturbances or to faulty metabolism. A case in point clearly demonstrates that fact, and to me it would seem of sufficiently great interest to report. A woman forty-five years of age, consulted one of you for an ulcerative gingivitis. Three months previously, while working in dirty wool in Red Cross work, she began to spit up a whitish membrane. The throat was sore and this would recur at intervals. The membrane of the nose became sore and afterward the gums became affected. Her dentist had seen some vesicles in the gum lesions. I have never before seen more intensely reddened gums. At times there were severe, griping pains in the bowels, accompanied by cold sweats, and at one time there was irritability of the bladder. The case proved extremely stubborn to treatment, both as to the gingivitis and the mucous membrane affections elsewhere. A few months elapsed and she developed a skin eruption between the shoulder blades of the nature of eczema, also a ringing in the left ear, and neuralgia. She complained of itchiness in the throat, with a feeling of pressure and a tendency to cough. There was such marked tenderness of the gums that eating was painful.

The disturbances continued on from month to month with some recession, and at other times, exacerbations, until nearly a year elapsed. Not until a month or so ago was there a fixed change for the better. When this change did begin there was both a general systematic improvement and a marked retrogression of the inflammation of the gums, and along with the local change, all the mucous membranes improved. The patient had been constantly under the care of dentist and physician, receiving both local and general treatment.

Though this case was a serious one, at times almost tragic, like with many another tragedy, some comedy crept in. The patient had been repeatedly warned about taking an excess of sugar, but not for months was convinced, and like a child she secretly carried her little bag of candy with her constantly, and, when she confessed, she stated that the amount she consumed each day was considerable. This excess was perhaps but one element in the etiology of the disturbance, and its effect was as a predisposing, rather than an exciting, factor. It was not possible to determine what special micro-organism was the most influential in producing inflammation of the mucous membranes, but it was suspected that the streptococcus might have been the one.

Have you noticed that the cheek pouch membranes and tongue covering may be a regular barometer of gastro-intestinal sluggishness, the tongue presenting an orchestra chair appearance and the cheek pouches an interdental line of swollen, sluggish, often easily bitten, mucous membrane? What better condition of things does one need as an improved incubator for the parasites ever present in the mouth?

If this is true, there is but one conclusion to be reached, which is, that the welfare of the patient depends upon the close co-operation of the two professions of medicine and dentistry.

The present is an age largely of prevention of disease in its preponderance over cure and it means that early diagnoses of deranged conditions are important and that these conclusions should be followed by careful education of the laity.

You might question my personal idea that the time to begin to safeguard against adenoids, diseased tonsils, gingivitis, and the multiple other things that happen to young children in the way of nose and ear conditions, called cartarrh, is often before the child is born. When one watches the life led by the pregnant mother, he can almost predict what the child will be up against. You do not question that his early feeding greatly influences the character of the permanent teeth.

GENERAL INFLUENCES REACTING UPON THE TEETH.

Just a word as to a very definite indication that the permanent teeth show the influence of very early constitutional interference. In tardy hereditary syphilis, this is true. The first teeth sometimes show defects of development, but this is by no means common. The characteristic failure of development in the teeth, known as Hutchinson's teeth, occurs in the permanent set. It is most marked, as you know, in the upper central incisors. The teeth stand apart, are peg-shaped, smaller than normal with a crescentic notch in the cutting edge which extends on to the front surface of the tooth.

As hereditary syphilis may creep on unsuspectingly, usually some time before puberty, you must often have an opportunity of being the first to observe it and the first to render aid in the proper direction, of the child's parents.

I stopped in front of a door sign not long ago which read, "Dr.

Blank, Children's Dentist," and the thought came to me, "How really interesting." We should, all of us, physicians and dentists both, consider ourselves children's dentists and be prepared to advise early enough to avoid much of the woe that comes later.

I have always felt that I have a personal kick against every one in general in the past for all that occurred with my own teeth and gums before I was ten years old. Yet we are still putting the cart before the horse.

Perhaps I should be more specific in what I have tried to convey. I might cite an example: Only recently a doctor's daughter, under five, was referred by a nose and throat man for chronic papular urticaria with intense itching and discomfort. The child had marked nasal obstruction without any anatomical change, was subject to hay fever and asthma. She presented the body of a healthy, robust little animal, but, withal, one was struck by the intense redness of the lower lip, and on looking inside the mouth, one could see congestion of the gums and the red tip of the tongue.

Through the extreme care given to an only child, everything she ate was watched, and, unfortunately, most of the food was of the soft variety, including much milk. The child needed an adult diet, plain wholesome food in ample variety, something on which to chew, regularity of eating and a minimum of richness. The mucous membrane conditions were recognized by the nose and throat man to be due to the same toxins that were producing the persistent hives. This child, should by all the rules of the game, be just such a one as would have pyorrhea later—in early adult life.

MERCURIAL STOMATITIS.

A brief consideration of mercurial stomatitis may be of interest. It is a disturbance that implies the administraton of mercury to excess, or an idiosyncrasy to the drug, influenced by the state of the mucous membranes and of the teeth. It is infrequent in the absence of teeth.

A perfect mucous membrane of the mouth should be pink and smooth, of firm consistency and close to the teeth at the edges of the gums, with but slight interdental pyramids which fill the interdental spaces almost to the contact points. Deviations from the normal are more commonly present than not, and spongy redundant gums, which fall away from the teeth, forming grooves or pockets are frequently seen. Food particles of protein character are forced into these spaces and are attacked by anerobic bacteria, mainly the fusiform baccilus of Plaut-Vincent and the spirocheta dentium. Another imperfection is produced by the formation about the teeth of deposits of calcium phosphate, commonly called tartar, which force the gums from the teeth and act as an irritant.

An ingenious explanation of the causation of mercurial gingivitis, given by Almkvist, is as follows: "Hydrogen sulphide gas is produced by the bacteria above described.* Mercury is taken up by the circulation and in reaching the capillary loops of the mucous membrane of the mouth, comes in contact with the sulphuretted hydrogen and forms the black sulphide of mercury, which is precipitated in the capillary walls. It is the disposition of this precipitate that gives the picture of a blue line at the margin of the gums. And this precipitate interferes with the function of the capillary loops in their transmission of nourishment, which, in turn, brings about degeneration and molecular death of the superimposed epithelium. This affected epithelium constitutes, therefore, additional dead proteid matter, furnishing still more nutriment to the anerobic putrefactive bacteria, and so on, progressively leading to erosions and to ulcerations of greater or less extent and depth, abscess formation, periostitis, necrosis, for instance of the lower jaw, and even the death of the patient."

You are quite familiar with the common symptoms of mercurial stomatitis outside of the typical gingivitis. The whole mouth may be red and tender, the patient complains of a disagreeable metallic taste, and has a characteristic nauseating fetor of the breath, and salivation. The teeth become sensitive in chewing or when smartly clamped together, or to acids, heat or cold, and they get a curious feeling of being too long; in some instances they may loosen and fall out. There may be neuralgia of the fifth nerve.

"Some locations are peculiarly sensitive to mercury, especially the gums just behind the lower last molars. † This seems partly due to the narrow angle between the tooth and the ascending ramus of the lower jaw. If the gum here becomes swollen, it is apt to be crowded and irritated in the angle. This irritation is increased if it falls at a time when the wisdom tooth is breaking through. The gums behind the upper front teeth are also extremely sensitive to mercury. Almkvist says that he finds the gums behind the upper molars sensitive and ascribes the sensitiveness to the existence of a natural pocket, called the pterygo-gingival angle, which lies between the pterygo-gingival fold of the mucous membrane that extends downwards and outwards from the palate to the gum, the tooth and the cheek."

The more severe forms of stomatitis are not common, but the milder grades are frequent and no doubt you are often consulted because of this condition.

In the treatment of syphilis, prophylaxis of mercurial stomatitis should always be kept in mind and the physician has to depend largely upon the dentist for this, as all tartar should be removed, decayed teeth filled or evulsed, and constant, proper attention given in the cleaning. Careful brushing after each meal, with other mechanical means of removal of food particles, and the use of a mild potassium chlorate paste are indicated. Potassium chlorate and hydrogen dioxide give off their oxygen readily and it is presumed that it is to this circumstance that they owe their effect in interfering with the activity of the anerobic bacteria, rendering them such useful agents in the prevention and treatment of mercurial gingivitis.

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*Almkvist, John, quoted from "The Treatment of Mercurial Stomatitis," by Douglass W. Montgomery, M.D., in the Medical Record, November 18, 1916.

†"The Treatment of Mercurial Stomatitis," by Douglass W. Montgomery, M.D., Loc. Cit.

Hydrogen dioxide is now regarded as almost a specific in mercurial stomatitis. Nicholas mentions that it will often prevent its development and frequently will cure one already under way. Scholtz says that as soon as the gums begin to swell and a purulent film appears, a very dilute perhydrol solution, 1:500 or 1:1000, constitutes the best mouth wash. The question as between hydrogen dioxide and perhydrol is an interesting one. Perhydrol is a thirty per cent. solution of hydrogen dioxide H2O2, and is free from acid. It, therefore, differs from the hydrogen dioxide solution of the pharmacopoeia in being acid free, and in being ten times stronger.

The addition, however, of a very small quantity of acetanilide stabilizes the H2 O2 and enables it to be made so slightly acid as not to be hurtful, so that the difference between the two preparations, when carefully made, is reduced to a matter of strength, and as they are almost always employed highly diluted in *stomatitis mercurialis*, this difference may also be equalized. Perhydrol has the disadvantages of being expensive and of being liable to explode. Expense under the circumstance, is a matter of importance as the free use of the mouth wash is essential. Roughly measured, a teaspoonful of hydrogen dioxide to a half glass of warm water in which a level teaspoonful of boric acid has been dissolved, is preferable to a stronger or weaker solution.

One might spend an almost endless time in the consideration of this extremely interesting and not uncommon affliction, but to save wearying you, I shall not go further into the subject. The physician needs the assistance of the dentist for the management of the intensified mercurial gingivitis sometimes caused by the mercury.

A NOTE ON VINCENT'S ANGINA.

An interesting point was brought out by Dr. Foerster at the meeting of the A. M. A. this last June, in an article on dermatology and associated disorders of the mucous membranes, that Vincent's angina may be mistaken for pyorrhea alveorlaris, also that "trench mouth" was identified as Vincent's angina.

It has been predicted that Vincent's angina, which, as you know is caused by the spirillum of Vincent and the associated fusiform bacillus, will be on the increase as it was so prevalent in France during the war. For a long time, Vincent's angina has been endemic, with the appearance of only occasional cases, and they at first arouse a suspicion of either diphtheria or syphilis. At times, only a microscopic examination determines just what it is. Since the spirillae and fusiform baccili may produce in the gums the picture of pyorrhea alveolaris in its ordinary form, it would seem important that it be given consideration by the dental surgeon.

MOUTH DRAINAGE.

The importance of the exceedingly rich lymphatic supply of the mouth and neck cannot be overestimated, both from its protective emplacement and from the standpoint of ready access to infective processes and to metastases from new growths.

Anatomically the lymph nodes of the head and neck are arranged in groups, forming a sort of collar about the upper part of the neck. These groups from back to front, are the occupital, the mastoid, the parotid, the submaxillary and submental. They are the first lodging places for metastases from above, likewise the first barriers to, and lodging places for, infections. The lymphatics from the posterior part of the scalp lead into the occipital group; those from the mid-scalp into the mastoid and parotid groups; those from the upper part of the forehead, the nose, part of the lips, and most of the cheeks, into the submaxillary group, and those from the lower lip and chin into the submental (suprahyoid) and, in part, into the submaxillary groups. The lymphatics from the front portion of the mouth lead, in part, into the submental and submaxillary groups and, in part, backward into the deep cervical chain of nodes. Those from the back part of the mouth and pharynx lead into the deep cervical chain. There are numerous communications between these groups. Frequently, infections from in front are carried backward, and those from behind are carried forward.

The deep cervical chains of the lymph nodes are the common collectors of infections from the various superficial groups and from the lymphatics in the pharynx and part of the mouth.

It is as necessary that the dentist should be thoroughly conversant with lymphatic drainage as it is for the physician, for it is to him that the physician must so frequently appeal when confronted with swollen or hypertrophied lymph nodes. The general public has been greatly benefitted by the keen observation, foresight and progress made in the last few years in the intelligent consideration of mouth and lymphatic affections as seen in the dental office.

With all our progress, however, there is still a tendency to attack disease wrong end to. In a recent series of lectures by Dr. Martin Fisher it was clearly demonstrated that the fundamental basis of disease is the process that takes place within the elemental cell, which process is limited to swelling, cloudy swelling and fatty degeneration, as three degrees of cell change short of complete destruction. Beyond this is cell death. To devote one's energy to the eradication of dead material may be necessary, but from the standpoint of idealism, it is the burnt end of the smoke. An attack, or the possibility of an attack, before destruction has occurred, or better still before the fault has arisen, whatever that fault may be, is far more to the point.

One of the natural functions of the lymphatics is physiologically one of prevention of the spreading of disease processes, especially of infections, and if the process is neither too virulent nor too malignant, or if relief can be gained in time and the change within the glandular cells limited to swelling, cloudy swelling or even fatty degeneration, there is a possibility of recovery, but when destruction of cells occurs, the gland becomes defective and is permanently changed.

With an infective focus in the mouth, the degree of reaction in the surrounding tissues is variable. The location of a swollen lymph node may point to the probable location of the focus, though not always. The amount and type of disturbance within the node is dependent upon a number of factors, such as the situation of the infection within the soft tissues or harder parts, the causative micro-organism and its especial virulence, and the natural resistance of the individual. This latter factor when sifted down really means the degree of oxidation possible, the greater the oxidation of the part, the greater the fight made against the disease process. Toxic products thrown off by micro-organisms may produce lymphatic reaction which will often readily subside with exposure of the focus and drainage or with its removal, but once the micro-organisms themselves have broken through their boundary and reached the regional lymphatic glands, it then becomes a doubtful question as to whether the process will stop there and retrogress rapidly or slowly, whether an abscess will result, or whether the infection may affect the surrounding tissues and produce a cellulitis.

Too much importance cannot be directed to proper drainage of the focus of infection when secondary glandular involvement has arisen. I can recall the teaching not long since that it was bad practice to remove an infected tooth when a secondary abscess had formed under the jaw for fear it would light up a still greater inflammation, but that one should wait until the secondary abscess was under control. Now that it is definitely known that the introduction of even a little oxygen makes it uncomfortable for the bacteria, how much better that constant aeration should occur, and especially that the original abscess, where often the most virulent of the micro-organisms prevail, should be drained or completely wiped out wherever possible. Then, too, from a cosmetic point of view, how much better it is to prevent the scars that in the past were so commonly caused by the ulceration of glandular abscesses through the skin.

From a diagnosis standpoint, enlarged lymphatic glands may present many interesting questions which are not all as simple as the common picture of an abscessed tooth, plus involvement of the submaxillary lymph nodes, producing a secondary abscess which points somewhere in the direction of least resistance.

The oral surgeon is often confronted with swellings under the jaw or in the neck, of greater or less degree, and the cause is difficult to find. Radiographs may or may not be determinative. This would seem especially true of streptococcic infections in which the ingress of the micro-organism may be a most minute thing and the secondary tissue response huge. There may be very little pus formation, yet many of the regional lymphatic glands may be involved with surrounding cellulitis.

I recall an instance of this sort seen with Dr. Hein. It was the case of a woman over sixty, who for more than a week had been developing an extensive, extremely painful, swelling under the jaw and in the upper part of the neck. She was in a condition of prostration. It was impossible to locate the beginning focus and careful exploratory punctures failed to find pus. The natural conclusion was that pus had not yet formed, but that the virulence of the infection and the low resistance of the patient were responsible for the tremendous reaction. Active attention in the mouth in the most likely location of the infection, external applications, rest, stimulation and, apparently, the use of anti-streptococcic serum sub-cutaneously administered, brought about resolution with the formation of a small abscess, which was easily located and evacuated. Recovery was fairly rapid.

Not always does rapid resolution occur, and even though the offending focus is completely removed, there may be some persistency of the second swelling. This harks back to the degree of change within the cell structures. With cells only swollen and without permanent change or destruction, resolution should be fairly rapid, but if the pathological process has progressed to such an extent as to cause degeneration or absolute death of cells, it is obvious that a return to a more normal state is accordingly slower. One must not overlook the fact that destruction in the hidden tissues may be repaired with scar tissue and there may never be a return to the normal. In other words, one cannot always get an immediate and rapid retrogression of swollen inflammatory lymph glands.

Another problem which may arise is that of the swelling of lymphatic glands subsequent to the removal of an infective focus or necrotic tissue, and it may be extremely difficult to determine why. The first supposition would be that not all the infective process was removed and this would most likely be true. However, there is a possibility that the original location may be free and that the causative mico-organism had become encased in a lymph node, lain dormant for a time, and later produced a reaction. It is one of the characteristics of the streptococcus to do this. A common sequela of the first influenza epidemic was that of fairly permanently enlarged submaxillary and cervical lymph nodes. I know of a number of instances in which, after weeks of time, surgical interference seemed to be indicated and was consummated.

There are a few axioms relating to infection that almost invariably hold good: When once the focus is located, it must be drained or removed; the more completely all necrotic tissue is eradicated, the speedier and more complete the repair. A secondary area of involvement by micro-organisms is best treated in the same manner as the primary focus, but it is here that thorough drainage usually suffices. The patient himself must be looked upon as the chief fighting force and his resistance has to be sustained and increased in every manner possible. This means rest, food of a substantial sort, not a light diet which, as one man expressed it, means broths or soup containing only that which the cow could not get rid of before she died, symptomatic medication, either locally or internally, or both. This latter would include tonics, stimulants, and possibly, vaccines in selected cases, or antimicrobic sera.— *PACIFIC DENTAL GAZETTE.*

If You Play Golf, Read This

THE NATIONAL DENTAL GOLF TOURNAMENT AT BOSTON IN AUGUST.

By The Editor, Dental Digest.

SOME years ago, a group of us finished driving from a tee in front of a hotel, and picked up our bags to start down the field. One of the guests on the hotel porch was heard to remark: "Isn't that a great game for a full grown man—to knock a little white ball down a field and then run after it!" No golfer will need to be told that he had never tried the game, that he had no idea of the amount of concentration, co-ordination, and patience required to keep that little white ball from performing any one of a thousand exasperating antics, and that he had never enjoyed the particular form of friendly rivalry characteristic of the game.

There are in the dental profession many enthusiastic and skillful golfers. There are many, like the writer, quite as enthusiastic, but far from being as skillful. To facilitate the enjoyment of this fine sport and to bring together dentists who ought to know each other better, there has been formed the tentative organization of a National Dental Golf Association, open to all members of the National Dental Association upon payment of a membership of $3.00 per year. The president is Dr. Frank M. Casto of Cleveland, and the secretary-treasurer is Dr. Ralston Lewis, 25 East Washington Street, Chicago, Ill.

It is proposed to hold a tournament on one of the links in Boston on Monday, August 23rd. The tournament will begin promptly at 8 A. M., Monday morning. Dentists may arrange their own pairs or foursomes for the eighteen holes in the morning. Dentists who have no one with whom to arrange to play will be provided with a partner at the tee.

As each presents himself at the tee, he will be required to present to the official there for the purpose, his handicap in his local club. The committee will arrange for the eighteen holes for the afternoon, and players are to be paired with others of about the same handicap. Each player who wishes to play in the afternoon will be required to turn in his score immediately at the close of his play.

Donations have been received from dental manufacturers and enthusiastic golfers which will be devoted to the purchase of prizes, and Dr. Lewis says that it looks now as if there might be a prize for at least a great majority of the contestants. All sorts of competitions will be arranged to make the event as interesting as possible.

The cost of the tournament to the player will be the $3.00 fee for membership in the Association, the charge made by the local club for the use of the field, and also one or two meals, and the caddy fee. It is probable that the entire day will cost somewhere in the neighborhood of $10.00. It is hoped that the tournament may lead to the formation of dental groups in clubs or small dental clubs and the maintenance of friendship and fellowship among dentists.

The conditions of play will probably not permit the starting of more than one hundred players upon the course. To enable the small committee to handle the event, and to avoid overcrowding at the last moment, entries will be closed when one hundred members have joined the Association. No member will be considered to have joined until he has paid his $3.00 fee. If a sufficient number, more than the first one hundred, remit their dues in time to give the local committee opportunity, a tournament will be arranged at some other links, under similar conditions.

If you wish to join this Association and play, send your check for $3.00 to Dr. Ralston Lewis, 25 East Washington Street, Chicago, with a note saying, "for membership in the National Dental Golf Association." Do not write to ask him what he wants of the money or a lot of other questions. He has been doing a pile of work on his own time and expense, and it is unfair to put on him for our own pleasure a particle more burden than is essential. I sent in my check before I wrote this article, so that there are only ninety-nine more chances left for the first tournament.

Do not think that you have to be a good player to join or to find other players with whom to have a good time. There will be four of us "dubs" to every good player, and we shall have much pleasure, because a half-dozen strokes more or less will not make any difference. You will enjoy the whole dental meeting better if you play Monday, will be in better physical shape to attend, and you will have something to think about on stormy days in the Winter by planning how to vanquish your opponent at the next dental tournament.

Building Extension—Royal College of Dental Surgeons

A FURTHER building extension will be made to the Royal College of Dental Surgeons during the present summer, to accommodate Pre-Dental laboratories and provide space for Practical Anatomy. The Anatomical Laboratory will be connected with the main building by means of an open-air passage, and it is expected that the new extension will be ready for occupation by the opening of the College session in September.

MEDICO-LEGAL ASPECTS.—The liability for the communication of diseases to a patient during dental operations is thus given by Noyes:

It is the duty of the practitioner while treating his patient, to use reasonable care and to employ reasonable skill not to communicate infectious or contagious diseases to the patient. This rule applies not only to the communication of a disease from which the practitioner himself is suffering, but also to the communication by the practitioner from one patient to another. If a dentist, knowing he has such a disease, allows the patient to visit him without appraising the patient of the danger and without taking proper precautions on his own part, and communicates the disease to the patient, he is liable to the patient for any damage the latter suffers thereby.

Not only is he liable for damages resulting from thus communicating a disease from which he suffers, but he is also liable if he negligently transmits a disease from one patient to another, as when having treated one patient known to him to have an infectious or contagious disease, he proceeds to treat another patient without warning such patient and without taking proper precautions against the communication of the disease.

The same rule applies whether the transmission of the disease was effected through the medium of the practitioner himself or by the use of infected instruments.—*Cosmos.*

MULTUM IN PARVO

This Department is Edited by
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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

PERFORATION FROM DRILL CANAL.—If the perforation is of recent date, use a soothing antiseptic and over the opening place a layer of tin foil, against which insert amalgam.—(*E.A.P.*)

SENSITIVENESS AT THE NECKS OF THE TEETH.—A saturated solution of carbonate of potassium in glycerine, applied to the points of sensitiveness, will counteract the action of ferments and allay hypersensitiveness.—(*A.C.H.*)

REMOVAL OF DEVITALIZED PULPS.—To harden the contents of root-canals and facilitate their removal after disintegration with arsenic, saturate a piece of cotton or spunk with a five per cent. solution of formalin and place over the stump after removal of the bulbous portion of the pulp, being careful in multirooted teeth to have the cotton large enough to cover all of the stumps. Over the cotton place a Teague disk and place temporary stopping or cement over the disk. Three days will effect complete devitalization and hardening.—(*J.I.H.*)

TEMPORARY CROWNS.—One often finds it difficult to restore, temporarily, anterior teeth, especially uppers, during devitalization, treatment or preparation of the root (and crown) for a Richmond crown. When the tooth is badly broken down, a celluloid synthetic porcelain form, fitted to the root and clearing occlusion may be filled with cement, and while the cement is soft, place it over the broken down crown. In this way, a devitalizing agent may be sealed in as well as restoring temporarily the natural crown of the tooth. If the root has been prepared for a crown, trim the synthetic crown form to fit the root, going under the gum slightly and clearing occlusion. select a base metal crown post and insert into the canal. Fill with white temporary stopping, warming and packing with a burnisher. Force this crown over the root. Allow to cool and remove with post attached. Place a little warm temporary stopping in the root and press the crown to place. This crown may be removed and used more than once. It resembles a tooth in which the nerve has been devitalized and does not look unsightly.—*Harold W. Hoag, D.D.S.*

SOLDERING TWEEZERS' POINTS.—I found that the constant heating of Angle's soldering tweezers holding the joints of the irridio-platinum band material together soon burst the ends away. Pieces of the standard of an upright incandescent mantle were substituted for the metal ends — *Dental Record.*

THE OIL STONE.—Oil stones improve with age if kept clean and well lubricated, but deteriorate if neglected and allowed to dry out any length of time. When fully saturated it is in its best condition, but if not cleaned the oil thickens and forms a coating on the surface. Kerosene oil in time hardens a stone and changes its quality; a saturated solution of caustic potash in water is preferable. Sperm oil is considered the best for edges.—(*B. B.*)

TO CHECK THE FLOW OF SALIVA.—A piece of ordinary absorbent cotton, twice the size of a pea, saturated in sandarac varnish and placed over the mouth of Steno's duct, with a large piece of bibulous paper to hold the cotton in position, will check the flow of saliva sufficiently to allow the treatment of superior molars or the insertion of a simple filling—(*C. B. C.*)

THE EFFECT OF TOBACCO ON THE VASCULAR WALLS.—*Conclusion*:—The inhalation of tobacco causes a contraction of the artery.

The rise of blood pressure after smoking may sometimes be due to a change in heart rate, sometimes due to the vaso-constriction independently.

The injection of nicotine causes a vaso-constriction. Such vaso-constriction is due either to the augmented adrenal secretion caused by nicotine, or to a direct, local action of nicotine on the vascular wall, or to its action on vaso-motor centre. Tobacco affects not only the artery but also the vein. The effect of tobacco in the vascular wall may be shaded somewhat by its action on hemoglobin, and consequently a vasodilatation may come to neutralize its result to some extent.—*G. Ni. Tsang, Journal of Laboratory and Clinical Medicine.*

POTASSIUM SULPHATE VS. SALT.—Pottassium sulphate is so far superior to sodium chloride as an accelerator for plaster and its compounds, that once the dentist has used potassium sulphate for this purpose, salt goes into the dental discard. It is somewhat more expensive, but the cast or impression is rendered so much harder through its use that the insurance against breakage is paid for in the added expense. Use the same as salt, or a better and cleaner way is to keep a saturated solution in a toilet water bottle and throw in a dash or two just before adding the plaster. Add alternately from time to time, water and potassium sulphate, until you note by the excess in the bottom of the bottle that you have a saturated solution.—*(Dayton D. Campbell,) Dental Record.*

THE COMPENDIUM

This Department is Edited by
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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

DANGERS INCURRED BY THE X-RAY OPERATOR.

We have all been cautioned about the dangers incurred through using an X-Ray machine without efficient protection being afforded the operator. Most of the cases cited seem to imply that the unfortunate results sometimes following the use of this valuable dental apparatus come about in a comparatively short period of time. Therefore, when we notice no early ill-effects following its use we begin to get indifferent of its dangers and put them down as being figments of the imagination. Perhaps we delude ourselves with the thought that the particular machine we are using is fully protected. It is just possible that the ill-effects may not be immediate but cumulative.

Dr. Chas. A. Eller, in *Dental Health*, calls our attention to this possibility. He operated an X-Ray machine for two years using as his only protection that which is afforded by the lead glass tube bowl or protector which is part of the equipment. No lead screen was used. After a time he noticed a slight breaking out of the fingers on the right hand. It resembled poison ivy eruption. This was painted with iodine and after two weeks treatment it became better. A few weeks later it broke out again. This time the eruption was much worse. The condition became so bad that work was impossible and dental office was closed. An infection accompanied the eruption and temperature rose several points. After a week's treatment, eruption cleared up and the doctor returned to his practice. After working a day his fingers began to blister and work was again discontinued.

Although several authorities were consulted, they insisted that the X-ray exposures had nothing to do with the condition. However, the doctor discontinued using the machine and the condition of his hands is constantly and rapidly improving.

It may be that some operators are more susceptible to the rays than others are, but it is well to have in mind the possibility that the ill-effects sometimes observed from exposure may not be immediate but accumulative. See then that you are fully protected at all times by suitable screens.

THE UNCERTAINTY OF THE RADIOGRAPH.

By F. C. Brush, D.D.S., in "The Dental Cosmos."

It is quite possible to play tricks on the X-ray and the experts who claim to interpret radiographs. The dark area of shadow about the apex of a tooth is almost invariably interpreted as an abscess, or an infected area, even when there are no other symptoms to corroborate it. Again, many teeth that are known to be unquestionably abscessed will sometimes show a clear normal condition in the radiograph. Devitalized teeth with empty canals will be interpreted as vital; canals filled with various dressings will be reported as unfilled. The question arises: Can the expert honestly say when the radiograph shows a dark area supposedly indicative of tissue destruction, whether it is or was an abscess, basing his judgment on the mere evidence of the radiograph alone?

A case in point: A crowned upper cuspid was radiographed by an expert who diagnosed the trouble as an abscess and recommended apicoectomy. A careful examination with a probe revealed that the root was split its entire length, and when extracted there was no sign of an abscess.

Another case: The expert radiographer at a medical institution made a diagnosis, from a radiograph, of a large abscess involving the area around two teeth, and insisted that an operation be performed almost immediately Fortunately it was only necessary to remove the two artificial teeth in order to dissipate the suspected abscess.

It is quite possible to radiograph perfectly healthy teeth from different angles and obtain shadows in some pictures and clearness in others.

Another common source of trouble or misinterpretation arises when an amateur radiographer takes a picture of a root with a dowel crown. The dowel stands out conspicuously in the picture and may show a space at the apex which is interpreted as a non-filled root. If another picture of the same tooth is taken at a slightly different angle it is possible to show the post protruding through the apex. Such misinterpretations are being made daily when explaining pictures to patients.

These cases are not cited with a view to discounting the value of the X-ray in diagnosis but to show that we ought to investigate cases thoroughly before ordering the extraction of teeth. A little less radicalism and a good deal more plain reasoning and common sense is called for.

MOUTH LESIONS.—It may be well to quote that master of medicine, who has recently passed from amongst us, Osler: "Know syphilis in all its manifestations and relations, and all other things clinical will be added unto you."

Convocation of Royal College of Dental Surgeons of Ontario

IT was my pleasure to attend the Convocation of the Royal College of Dental Surgeons on May 7th, 1920, and the impression left on me was a very vivid one. I have never seen a finer body of young men than those who assembled at Convocation Hall that evening to receive their degrees. If that is an index of the character of men who are entering the profession in Ontario, then I have a prediction to make. It is this—that in a very few years dentistry in that province will be in the vanguard of professional progress. "Quality counts," and the quality represented by that class was of the very highest. There was an earnestness, a seriousness of purpose manifest in their faces that augured well for their future devotion to the best interests of their chosen profession. It was all very encouraging and inspiring, and I came away from Toronto quite elated over the prospects for dentistry in Ontario.

And then the new building—what an achievement that is! What a home of education for all the boys who enter dentistry in the future. And the announcement that the Legislature had just appropriated $100,000.00 to pay for it. Why, the whole thing sounds like a fairy tale, and I had to rub my eyes to see if I were awake.

I wonder if the members of the profession in Ontario realize the splendid heritage that is theirs. I wonder if they know that they are really in a class by themselves. The profession owns the college, and every licentiate in the Province has a say in its management. The Board is elected by the profession, and is directly responsible to the profession for its conduct of affairs. Every man in dental practice in Ontario can step into the college halls and say to himself truthfully: "This is my institution—it is part and parcel of my fellow-practitioners and myself—I have an integral interest in its welfare, and a right to glory in its achievements."

It seems to me that every dentist in Ontario is entitled to hold his head a bit higher because of this wonderful institution. It has grown up in their midst as a monument to the efforts of those most closely associated with its development. It is not the work of one man or of two men, but of many men. True, there have been certain men whose names stand out conspicuously as having contributed the major part to its splendid growth, and while obviously it might not be seemly to speak in person of the men most active at the present time, yet when the early days of the college are recalled it is impossible not to mention such men as the late Drs. J. B. Willmott, Luke Teskey, and W. T. Stuart. All down the line since then there have been men tried and true who have directed the policies of the college, and brought it to its present commanding position among the dental educational institutions of the world.

All honor to these men—the men of yesterday, and the men of to-day. They have wrought well and wisely for the best interests of dental education in the Province, and have built up a tradition in the good old R.C.D.S. that has a real as well as a sentimental value. It is a heritage for all time that will be priceless to the generations yet to come. I pay my humble tribute to these men, and I glory in the fact that I am an alumnus of the institution.

Then I found one other thing that pleased me—the inauguration of the Dental Nurses' Course. Seventeen young women had just completed a course of study fitting them to take positions with practitioners as young lady assistants, or, as the curriculum has it, as Dental Nurses. No one to-day can predict the far-reaching benefit of this movement. I was told that practically all of these graduate nurses were snapped up by members of the profession as assistants. No wonder! That is—all were secured as assistants except those who had been snapped up by members of the senior class as partners—for life! Well! Who could blame the Boys? Not I, after looking into the faces of that class of Dental Nurses. It was all very inspiring to me—all very delightful—and all very encouraging. I could write an entire article on that one class of young ladies, but I have on previous occasions written much about the young lady assistants, and must content myself at this time with extending to them my heartiest congratulations and my very best wishes.

Hats off to Dental Education in Ontario! It seems to me more promising than at any time in its history, and I predict for it in the future a development undreamed of by even the most enthusiastic

C. N. Johnson

ORAL HEALTH

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EDITORIAL

The Dental Nurse

THE matter of efficient assistantship for the busy and progressive dentist is a subject that has engrossed the mind of the dental profession, more particularly in recent years. An educated and enlightened public has, of late, been clamoring for dental service to such a degree that most practitioners have found themselves quite unable to cope with the demands of such an exacting clientele.

In an effort to solve this pressing problem, and especially to overtake the ever-increasing need for oral prophylaxis, many of the states across the border have so amended their dental acts as to authorize the training and graduating of an auxiliary dentist, to be known as the Dental Hygienist. This Dental Hygienist is authorized to practise dentistry to the extent of scaling and polishing the exposed surfaces of the teeth, such practice to be carried on only in regularly conducted dental offices or in the public clinics.

The dental profession of Ontario, through its Board of Directors, is trying to solve this problem in quite another way. The status of the ordinary office assistant is to be raised, by means of a regular college training, to the standing of a profession or calling known as the Dental Nurse. At the beginning of the 1919-20 college term of the Royal College of Dental Surgeons, the first class for the training of Dental Nurses was enrolled. This course consisted for the most part of suitable lectures and training in such subjects as office care and management, operative and prosthetic dentistry, oral hygiene and state dentistry, professional ethics, sterilization and care of instruments, X-Ray, exodontia and pathology, book-keeping and typewriting,—the aim throughout the whole course being to give such instruction and training as will enable the Dental Nurse to render to the dentist the best possible service within her legal qualifications.

The first year's course, although handicapped by many difficulties, has fully realized all expectations, and we believe the future of the Dental Nurse in Canada has been assured.

On Saturday evening, May 8th, the first graduating exercises in this connection were held in the College building, when sixteen young ladies who had taken this first course graduated from the Royal College of Dental Surgeons as Dental Nurses.

The function, which was presided over by the President of the Board of Directors, proved a most interesting one, and was largely attended by friends of the graduates and members of the profession. The following official pledge was signed by each of the young lady graduates, and is indicative of the moral and ethical foundation upon which the Dental Nurses are building their future:

> "I solemnly pledge that in the practice of my profession I will always be loyal to the welfare of the patients who come under my care, and to the interests of the practitioner whom I serve. I will be just and generous to the members of my profession, aiding them and lending them encouragement, to be loyal, to be just, to be generous, to be pure, to be upright, to be trustworthy, to be observant, to be tactful, to be studious.
>
> "I hereby give my pledge to devote my best energies to the service of humanity in that relationship in life represented by the title of Dental Nurse conferred upon me by the institution in which I have been privileged to receive my training."

ORAL HEALTH extends its sincere congratulations to the members of this first graduating class of Dental Nurses, and trusts that they may prove to be a real service and uplift to the dental profession.

Congratulations, Doctor Box !

AT the Annual Convocation of the University of Toronto held in June, the degree of Doctor of Philosophy was conferred upon Dr. Harold Keith Box, of the Faculty Council of the Royal College of Dental Surgeons of Ontario. Dr. Box graduated in Dentistry in the year 1914, and was made Fellow in Pathology for 1914-15. He devoted his post-graduate studies to pathological and histological problems involved in Dental science and practice, and the degree of Doctor of Philosophy has now been conferred following the successful completion of a thesis and examinations concluding three years of post-graduate work in the subjects of Pathology, Bacteriology and Histology.

Dr. Box's work is most important both from the scientific and clinical aspects, and the entire Dental Profession will be glad to learn of this new honor which has been conferred upon Dr. Box in recognition by the University of Toronto of his excellent work.

We believe that this is the first time in the history of Canadian Dentistry that any University has conferred the degree of Ph.D. upon a member of the Profession, and consequently the Profession itself, as well as Dr. Box, is to be congratulated upon this recognition, which adds additional lustre to the degree of Doctor of Dental Surgery.

It is to be recalled that Dr. Box was made a Fellow of the American Academy of Periodontology at its meeting in New Orleans, last year, and is a member of the Post Graduate Faculty of Columbia University, New York City. At the recent meeting of the Board of Directors of the Royal College of Dental Surgeons of Ontario, Dr. Box was made Professor of Dental Pathology and Periodontia.

Canadian Dental Association Convention—Ottawa

"A man's reach should exceed his
grasp, or what's a heaven for?"
—Browning.

THE surest road to stagnation and retrograde in any profession or business is isolation from our fellows of the same calling.

The dentist is no exception. It is only by coming in contact with other minds and personalities, by the exchange of ideas with its spur and tonic effect, that latent possibilities in oneself are brought out. Half formulated thoughts find their complements and the "half ideas" which were of little value, become "whole," and an asset and incentive to all. What if you do hear someone with a "million dollar" practice get a lot off his chest about how it "should" be done. That's just where your "reach" exceeds your "grasp." Some day you'll grasp that rung and "reach" for a higher one. He's undoubtedly right or he wouldn't have achieved his present success. The difference in the circumstances of your neighborhood and his, may make it impossible for you to do what he does, but you may grasp at the more ideal method, improve your technique, give your patients better satisfaction and have the satisfaction of knowing that you, and you alone, are responsible for a better degree of health and comfort in your people, than would have been possible had you not come to the CANADIAN DENTAL ASSOCIATION CONVENTION in OTTAWA, August 17-18-19-20th of this year.

S. G. McCAUGHEY, D.D.S.,
Chairman Publicity Committee

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, JULY, 1920 No. 7

Shall Pulpless Teeth Be Retained?*

C. N. Johnson, M.A., D.D.S., Chicago, Illinois.

Introduction.

THE query raised by the title of this paper is a natural one in view of the agitation which has shaken the medical and dental professions in recent years over the subject of focal infections, and their possible relation to pulpless teeth. If we are to serve, in the most acceptable manner, the people who come under our care, we must study this subject with conscientious endeavor, and we must above all things seek to obtain a proper perspective so that we may be able to judge evidence, and therefrom to arrive at decisions that shall result in the greatest possible benefit to our patients.

The very fact that your program committee has assigned such a subject to the essayist is *prima facie* evidence that there is, in some quarters at least, a suspicion attached to the practice of retaining in the mouth any teeth that have lost their pulps. It would sometimes seem as if more than half a century of constant experience and observation on the part of the dental profession were to be cavalierly swept aside by a wave or two of the hand, and that the dicta of certain members of the medical profession followed by those of certain members of the dental profession were to override all the clinical experience obtained since pulpless teeth began to be filled.

Retention or Extraction of a Pulpless Tooth Should Depend on its Condition.

The question, "shall pulpless teeth be retained," may be answered at once and briefly with the remark that it all depends on the condition of the pulpless teeth. If a tooth is abscessed and the abscess cannot be cured, then by all means the tooth should be removed. No one with a conscience would wish to argue for the retention of an abscessed tooth in the mouth. The profession is surely all in agreement up to this point. The place where divergence of opinion seems to start is in connection with the retention of pulpless teeth, abscessed or not abscessed; and also in connection with the question as to whether or not it is ever possible to really cure a tooth when it has once been abscessed. The impression has gone out from some quarters that the moment a tooth has lost its pulp it becomes a menace to the physical well-being of the individual, and should, therefore, not be tolerated in the mouth.

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*Read before the Massachusetts Dental Society and the graduates of the Royal College of Dental Surgeons of Ontario. Published in December, 1919, Journal of Dental Research.

This is so at variance with the clinical history of countless numbers of pulpless teeth that it cannot be permitted to go unchallenged. Pulpless teeth have been of such incalculable service to people, and are capable in the future of being of still greater service through improved methods of technical procedure, that it will not do to sacrifice them on mere assertion. There has been altogether too much *ex parte* evidence on this subject, too much theorizing, too much panicky reasoning from illogical premises, too much reliance on laboratory experiments alone without studying sufficiently the things that actually happen in the mouth. This much is true, that if all the pulpless teeth of the past had been sacrificed very many individuals who have enjoyed the blessings of adequate mastication would have been sadly crippled, with all the consequent ills which follow a failure to properly perform this function.

But we are told by the alarmists that the lurking ills which accompany the retention of pulpless teeth have sent numberless people to their graves prematurely, with the source of their ailment all unsuspected. Undoubtedly the retention of diseased teeth has been accountable for much ill health, a fact which the dental profession has for years been trying to impress upon the medical profession and the laity; but there are two aspects of this subject which at this time call for consideration. One is that the role played by teeth as a causative factor in disease has been exaggerated in recent years out of all proportion to the facts, and the other is that pulpless teeth are not necessarily diseased teeth.

Present Status of Our Knowledge on the Relation of Pulpless Teeth to Systemic Disease.

It is a very difficult thing to obtain reliable data on the causes of disease, particularly chronic diseases, such as those most usually attributed to metastatic infection from pulpless teeth. The fact that the same micro-organism has been found at the ends of roots of pulpless teeth as in arthritic joints has been accepted as indisputable evidence that the teeth are the cause of arthritis. Possibly this is true in some cases, but it has not yet been sufficiently proved. There is nothing to show that the micro-organism had its habitat first around the teeth, and second in the joint, any more than there is that it was the reverse. That some cases of this ailment have improved after the extraction of the teeth is true, but this is not conclusive evidence. No one can say that the cases would not have improved without the loss of the teeth. In truth it is a clinical fact easy of verification that many of these cases have cleared up where the teeth have been retained, and be it said, retained in opposition to the orders of the physician. Not only this but in altogether too many instances the natural teeth have been sacrificed without the slightest amelioration of the systemic symptoms, leaving the victims in a much worse condition than before.

These facts must "give us pause" and make us more conservative in our judgment, and more careful in weighing evidence. Yet with all of this, as has already been stated, no one of conscience wishes to retain diseased teeth in the mouth. The very possibility that they may cause systemic trouble should place upon us the obligation of seeing that they are either made healthy or removed. And it is just at this point that your essayist has his chief quarrel with many of his colleagues of the medical profession, and some of those of the dental profession. He believes it possible in the case of many teeth which are to-day being condemned—even pulpless teeth—that they may, by proper treatment, be made healthy and serviceable, and he enters his earnest protest against the altogether too routine manner in which so many teeth are being consigned to the forceps.

Time was when the profession were foolishly conservative about the extraction of teeth, even to the extent in some instances of affirming that no tooth should be removed from the mouth which could not be taken out with the fingers; and the revulsion from this absurd position has carried us too far to the other extreme where a natural tooth is almost looked upon with suspicion as an enemy of the human family, and condemned for execution without sufficient evidence.

The Need for Cooperation Between Physicians and Dentists; and for Appreciation of the Success That May Attend Skilful Root-Canal Treatment.

For a proper perspective of this whole question there needs to be a closer cooperation between medical men and dentists, so that we may obtain a clearer vision as to what is for the best interests of our patients. To take the position that most pulpless teeth cannot be made healthy and serviceable is to question the ability and judgment of some of the best men in the dental profession; and yet, when we consider the manner in which pulpless teeth have so frequently been treated in the past, we cannot too much marvel at the suspicion raised against them. For years the management of pulpless teeth did not receive the attention it deserved, with the consequence that there was so much slipshod work that the wonder is that pulpless teeth did not give more trouble than they did. Neither must we ignore the fact that to properly treat and fill some pulpless teeth is a very difficult operation, and in the hands of the most conscientious operator there is sometimes a failure to obtain satisfactory results. We must recognize these things; but, when all this has been acknowledged, there still remains the fact that with a proper grasp of the situation and painstaking technical procedure, pulpless teeth may be saved in the vast majority of cases. To say other than this is to question the efforts of such men as Rhein, Best, Buckley, the late lamented John R. Callahan, Coolidge, Gethro, Howe, Edmund Noyes, and a host of others who have devoted their energy to the perfection of this work. The details of their methods have not all been similar, but they were all working to the same end of making pulpless teeth safe and serviceable. And be it said that they have largely succeeded. Dr. Noyes, for instance, has on record one case of an upper lateral incisor—a tooth usually considered difficult of management and prone to abscess—which, after having been cured by him of an abscess with a sinus opening and the root filled, gave continuous satisfaction for a period of more than fifty-three years and was still in good condition when last observed. It may be said parenthetically that, if pulpless teeth are necessarily such a menace to health as they are suspected to be in some quarters, this patient must have been possessed of a particularly tough constitution.

And in this connection it may be well to consider the fact that, with most individuals who have lived to advanced age, the probability is that they have had at various times in their lives pulpless teeth; in fact, it is the exception rather than the rule when they have not had them. And yet all of this is no argument in favor of the retention of pulpless teeth if they are diseased. Again, the fact cannot be too strongly emphasized that if a tooth is not amenable to successful treatment it should be extracted.

The present agitation has been productive of great good in one direction. It has tended to focus attention on pulpless teeth, and has led to improved technique and greater care in their management. Never again in this generation will slipshod methods of treating pulpless teeth pass muster. Men are more assiduously than ever devoting their energies to solving the very difficult problem of properly filling the root-canals of teeth. At least, this may be said, that today they are trying to eliminate the tendency to infection around pulpless teeth, where in times past it would seem as if they wholly ignored the possibility of infection. This is a decided step in advance.

THE X-RAY AS BOTH AN AID AND A MENACE TO MODERN PRACTICE; AND THE UNWARRANTED ASSUMPTIONS AND UNPROFESSIONAL CONDUCT OF SOME RADIOGRAPHERS.

One great aid and one great menace to modern-day practice is the X-ray. Never has a greater boon been given to dentistry than this, and never has a worthy method been put to more ignoble uses. The X-ray showed us the limitations of our pulp-canal work, it exposed the ghastly discrepancies between what we should do and what we did do. It also showed us the impossibility of doing some of the things we had tried to do; and altogether it gave us a greater insight into, and a better perspective of, the results of our technical procedures. It awakened in us a new conscience and stimulated us to do better work. We are indeed its debtor in an immeasurable degree in these various respects. It also showed us the ravages of absorption in the bone around root ends, and furnished the means of investigating conditions which previously had been a sealed chapter to us.

But it misled us in some respects, and it was used as the medium through which much outrageous exploitation was foisted upon the people. It misled us because of our faulty interpretation and because of its limitations as a discloser of conditions around root-ends. Immediately, and it may be said quite naturally, the profession jumped to the conclusion that any shadow in a skiagraph at the apex of a root meant an abscess or an infection. Some of them undoubtedly did, but there were many of these cases in which it was quite impossible to say whether a shadow meant an abscess or whether it was simply a thinning of the bone from some absorptive process that may have occurred years previously, and in which today there was positively no infection whatsoever. The skiagraph shows merely different degrees of density. It does not show pus, or demonstrate infection, and the sooner we recognize this the better it will be for our patients. There have been many cases in which skiagraphs showed very little rarefication at root-ends and yet the extractions of the teeth brought with them granulomata clinging to the roots. There are required, in addition to diagnose with the X-ray, a careful clinical examination and a study of the history of the case, before judgment can be passed; and even then there are many instances in which it is exceedingly difficult to arrive at a definite conclusion.

But what has been the practice in the recent past? Radiographers have sprung up on every hand, and to say that they have played on the fears of the people is a very mild statement of the facts. They have presumed, many of them, to diagnose cases in the most offhand and even flippant manner. They have written the terms "pus pocket," "abscess," and "infection," opposite these rarefied areas without the slightest compunction, when, as a matter of fact, they knew absolutely nothing of what they were writing. They have played havoc among patients by handing them these formidable documents with all those terrible words written over them. They have frightened people in numberless cases where there was positively no justification for it in the smallest degree. In some instances there is no question that it was done for effect—merely to impress people with the wonderful power of the X-ray and to prove its great significance in the diagnosis of disease. In other words, it was being capitalized in a most unwarranted manner.

It is not here intended to reflect on the value of the X-ray, or to make a sweeping criticism of the men who are engaged in this important work. Many X-ray men are careful and conscientious, and are doing much to aid the dentist in clearing up obscure conditions, but not one of them has the right to give a diagnosis to a patient. In the first place, it is not his function; in the next place, he has no certain means of knowing, when he is dealing with a subject like pulpless teeth, whether or not his diagnosis is correct. Very often in the past it has been wrong. Vacant spaces where teeth had been extracted have been marked "abscess," as also have cases where the pulps are still living.

The statement to the patient that there is an abscess in the mouth, or that there is infection, leaves an impression on the mind that is not easily eradicated. It sounds terribly formidable to the patient; and the dentist or physician—to say nothing of the x-ray man —should be very sure he is right before he subjects the patient to this kind of fright. In the art of healing, the effect of mentality plays a very important part, as is only too well known by observant medical practitioners. Of course, in this connection reference is made chiefly to those numerous cases where individuals have little in the way of tangible pathology, where they are not feeling quite up to the mark, where the liver is sluggish, where there is a slight trace of rheumatic pain—all those symptoms which drive them to the physician for consultation. There are so very many cases of this kind in the routine practice of the family physician, where the pathology is vague and elusive, that it is little wonder that the physician turns to every known expedient to account for the trouble. Just now metastatic infection is held accountable for most of these cases, and the teeth are suspected of being the chief culprits. Consequently teeth are talked about and written about as never before. They are discussed in medical societies, in the public press, and in the ubiquitous social circle. Their importance as a possible pathologic factor is magnified out of all proportion to the facts, and they come in for a sweeping condemnation and a suspicion altogether unwarranted. When everybody talks teeth and thinks teeth it is extremely easy to work up a very plausible case against them. This seems to be the mental attitude of a great many people to the subject under consideration, and this attitude is accountable for the loss of numberless serviceable and useful teeth.

We must aim to maintain a "safe and sane" position in this matter, trying to achieve balance, and not losing our bearings in the popular clamor. It will not do to have the people stampeded out of all reason toward the destruction of so many useful organs of mastication, any more than it will do for us to sit down supinely and ignore the fact that a diseased and neglected tooth may do incalculable harm. Again, let it be said that if a tooth cannot be made healthy it should be extracted, but in the same sentence the statement should be emphasized that very many of the teeth which to-day are being consigned to the forceps may be made perfectly safe and wholly serviceable by modern methods of treatment.

The Importance of Oral Hygiene and Prevention of Caries

It will take considerable time and much careful observation before the precise status of the pulpless tooth shall be definitely established in the professional mind, but meanwhile there is one phase of the subject over which there can be no two opinions. Manifestly if we admit the possibility of trouble from pulpless teeth, we must all agree that to prevent the loss of pulps is the one supreme desideratum. More and more must the energy of the profession be directed toward this fortunate consummation. In the past pulps have been destroyed too freely, too thoughtlessly, on the Hibernian theory that if a pulp showed its head it should be hit. It is not here intended to discuss the possibility of saving a pulp after it has once been exposed—a subject which is open to differences of opinion—but it is at all times and on all occasions appropriate to create a contention in favor of such early and constant supervision of the teeth that pulps are never permitted to become exposed. This is the trend toward which future dentistry must be directed, and it has two aspects worthy of our most careful consideration—the one relating to such an education of the people that children are sent frequently to the dentist for examination of the teeth, and the other that the practitioner shall do his part with such painstaking care that large cavities are the exception rather than the rule. That this is possible has been demonstrated in too many instances to be longer questioned; and, pending the day when we shall go one step farther and prevent dental decay altogether, this comes the nearest to anything we have ever had of the dental millennium itself.

General Conclusions.

To sum up, pulpless teeth may be retained whenever they are amenable to successful treatment. Most pulpless teeth are amenable, and therefore most pulpless teeth may be retained.

Oral Syphilis

A Consideration of this Subject Especially Intended for Dentists.

By Herman Goodman, B.S., M.D., New York, N.Y.

HISTORY.

THE question of the antiquity of syphilis, as we know the disease since 1492, is a moot one. Whether, as has been claimed, syphilis was unknown to the Europeans prior to the return of Columbus from the New World, or whether the end of the fifteenth and the beginning of the sixteenth centuries marked a pandemic of the disease, which had long existed among the people of Europe, is difficult to decide. The evidence is slightly in favor of the importation into Europe of the disease by the sailors of Columbus who had been infected on their trips to America, probably on the first trip to Hispanola or Haiti. It is interesting in this connection to note that the original Caribs, the Indian inhabitants of the islands of the Caribbean Sea and its mainland boundaries, were characterized by very poor upper central incisors. This character is still marked in the present descendants living in the Antilles.

Certain it is that the armies of Charles VIII carried syphilis into the remotest parts of Europe, and the savants of the period acclaimed it a new disease and presented it with as many names as there were observers. Fracastoro (1484-1553) has the distinction of naming the disease from the swineherd hero of his poem, which was the earliest popular work on the disease.

The first instance on record, according to Josso, of a syphilitic lesion of the mouth dates back to 1560, when Botal observed a syphilitic chancre of the mouth. About the same time Brassavola called attention to the syphilitic chancres met with in children, which had been given to them by their nurses. From that time on Ambrose Pare, Fallope and others all observed the buccal chancre.

According to Bulkley, the earliest recorded cases of transmission of syphilis in dental operations were in connection with the transplantation of teeth during the last quarter of the eighteenth century. "John Hunter (1786), in whose time the operation of transplantation seems to have been extensively performed, was forced to admit the transmission of syphilis in two out of seven cases. He also readily admitted the possibility of such inoculation through other dental operations. J. C. Lettson in the same year reports a number of cases which came to his notice, some of which he pronounced undoubted syphilis due to the same cause." (Quoted from Miller.)

During the century since, and even during the early period of modern dentistry, cases of syphilis acquired in the dental chair have been recorded. Recently I observed a case in a young officer who undoubtedly received an unmerited syphilitic chancre at the site of a tooth extraction during the operation.

SYPHILIS AND DENTISTS.

It is the duty of dentists to acquaint themselves with the various lesions of syphilis found in the mouth, and lesions which simulate syphilis should be regarded as suspicious. The dentist should observe extra precautions until he has had the patient consult his or her physician, and received an expert opinion. The reasons for this are almost self-evident, and concern the welfare of the patient, because what his non-technical knowledge considers merely a "cold-sore" may be an early chancre. Immediate treatment before the generalization of the disease makes absolute cure almost certain. Further, the dentist must protect himself against infection and its result to self and family. Thirdly, the dentist must consider his other patients, since the disease may be transmitted through intermediate sources as instruments, cups, etc.

PREVALENCE OF SYPHILIS.

Estimates from hospitals, out-patient departments, obstetrical services, etc., have given the prevalence of syphilis in the general population as about ten per cent. Although classed for many centuries as a venereal disease, syphilis may be transmitted by other than sexual practices. Bulkley collected statistics of 9,058 extragenital chancres, of which 1,810 were on the lips, 734 in the buccal cavity, 307 on the tonsil, 157 of the tongue, 37 of the gums, and 145 of the cheeks; that is, over forty per cent. were in the dental field. More recently (1910) Scheuer collected 24,855 recorded cases of extragenital chancres, of which 5,665, or about one-quarter of the whole number, were upon the lips. In 1,575 cases the chancre was on the buccal mucous membrane; 1,608 on the tonsil; 448 primary lesions of the tongue; and 154 of the gums. There were 2,838 recorded chancres of the nose, neck, chin and forehead. Porter at the Barnard Free Skin and Cancer Hospital reported 24.5 per cent. of 295 patients with chancre presented the initial lesion of syphilis on other than the genital surfaces. Of the 54 patients so affected 31 presented the chancre on the lips (9 on the upper and 22 on the lower); 6 on the tongue; 2 on the cheek; 2 at the angle of the mouth, and 1 on the tonsil. Porter also reported from the Washington University Dispensary about 11 per cent. of the total primary sores located extragenitally; 6 on the lower lip; 1 each on the tonsil, cheek and tongue.

INFECTION OF DENTISTS.

It has been estimated that about 35 per cent. of all the chancres of the finger have been found among dentists. Other dentists have been infected through the habit of holding instruments between the teeth. One dentist is reported to have been infected by scratching himself on the jagged tooth of a patient, and then to have contaminated the wound by the instrument which had been in an infected patient's mouth.

THE CAUSE OF SYPHILIS.

In 1905 Fritz Schaudinn (1871-1906), working with Erich Hoffmann, demonstrated under the microscope the causative agent of syphilis, the Spirochæta pallida, or, as Schaudinn later named it, the Treponema pallidum. This organism satisfies the postulates of Koch, namely, that (1) it is a specific organism always associated with the disease, (2) when isolated in pure culture, and (3) inoculated into a healthy susceptible animal produces the disease, and (4) may be obtained again in pure culture.

The method of choice for the diagnostic demonstration of the S. pallida is the dark field illumination method. The staining by India ink (Burri) or by Giemsa may be used, but are not so satisfactory. The S. pallida observed under the dark field is a motile organism. It is about seven microns long (diameter of a red cell), has an average of eight turns, is exceedingly thin, straight, and has a regularity of spiral that makes it seem possible to run a ramrod through its long cylindrical axis. The motions are (1) a spiral, corkscrew, or "bit" motion; (2) back and forth in the fluid medium so that it remains in the same field for a long time, and (3) a rising and sinking motion, making it essential to focus to keep the same organism under observation. The S. pallida maintains the same form when at rest. Double, triple, or even giant forms may be observed.

Smears from the mouth are contaminated with the Spirochætæ macrodentium, microdentium, and buccalis. There is no difficulty in distinguishing the coarse macrodentium with its smaller number of thickly set spirals from the delicate pallida, but the microdentium and buccalis may give some trouble unless one possesses an intimate knowledge of the behavior of the offending organism. The last named are both as fine as the pallida, but they move differently, have not the same form maintained throughout their course, change character when at rest, and are likely to have one or more spirals uneven in height. A study of the usual spiral flora of the mouth will be well repaid by the wealth of information acquired. Tooth cavities and the spaces between the teeth are the incubators for this type of bacteriological investigation. It will be surprising to most to have revealed an indefinite number of organisms even in the most cleanly kept oral cavity.

VULNERABILITY OF THE S. PALLIDA.

It is important for the dentist to have some ideas as to the vulnerability of the S. pallida. In its natural habitat, the lesions of the body, it is alive and infectious. In the laboratory under special conditions, they may be kept alive indefinitely. If moist, as on a wet towel, Zinsser and Hopkins showed that they were viable after eleven hours, even if exposed to room temperature and sunlight. It has been proved by numerous observers that drying causes the organism to lose its power of motility, and that after drying, infected objects are no longer capable of transmitting the disease. Reasoner has shown that soap has in all probability a lethal effect on the S. pallida. Recently I have been experimenting on the action of weak acetic acid, and on the basis of clinical observation and microscopic examination I think that acids have an equal lethal effect. The observations of Metchnikoff, that the local application of 33 per cent. calomel ointment to the site of inoculation of S. pallida prevented the development of the infection, providing the local treatment were made within several hours, are very important. Mercuric chlorid in 1:1000 solution is about equally effective. The practical application of these observations is that the dentist who may accidentally come into intimate contact with infectious syphilitic material should *immediately* wash with plenty of soap and water, and apply a 33 per cent. calomel ointment in lanolin base, rubbing for five minutes.

THE WASSERMANN TEST.

In 1906, Wassermann working with Neisser and Bruck brought to the profession a practical blood test for the detection of syphilis. Although this test bears Wassermann's name it was based on previous work of Bordet and Genou on the fixation of complement.

The Wassermann reaction is a delicate test depending on many factors. It is beyond the scope of this writing to describe the test in detail with its many modifications. It is necessary for the dentist to know that a report is reliable only if from a well-controlled laboratory, and that the test should be regarded, so to speak, as one symptom, rather than as the diagnosis. Clinical observation and bacterial investigation should be considered.

A report of four plus positive Wassermann from a reliable and painstaking laboratory undoubtedly means that the patient has or has had active syphilis. The so-called paradoxical four plus or non-specific positive reactions occur in Frambœsia tropica, (Yaws) sleeping sickness, and in nodular leprosy, but these diseases are of infrequent occurrence in temperate climes. Slightly positive reactions may occur in tuberculosis, and perhaps in measles and scarlet fever.

The New York City Board of Health advisably states on the back of each report:

INTERPRETATION OF THE WASSERMANN READINGS.

++++ means very strongly positive; +++, strongly positive; ++, positive; +, weakly positive; ±, doubtful; —, negative.

A diagnosis should never be made from a weakly positive or doubtful reaction (+ or ±), but in a case of syphilis that has had specific treatment such a reaction would indicate the necessity of further treatment.

A weakly positive or doubtful reaction (+ or ±), where there is no specific history and where the test is made simply as an aid in diagnosis, is usually considered negative. A negative Wassermann reaction does not absolutely exclude the possibility of syphilitic infection.

In primary syphilis, period of chancre, the Wassermann is negative, although the S. pallida may be found in the sore. This is an example of syphilitic infection with negative Wassermann. Later in the primary stage when the lymph nodes that drain the area of the chancre become enlarged, and the spirochetes are probably circulating in the blood, the Wasserman becomes positive. In the stage of generalized eruption, the secondary stage, the Wassermann is regularly positive. In the tertiary stage, perhaps 80 or 90 per cent. of syphilitics give a positive reaction, but a small percentage of undoubted syphilitics never give a positive result even after treatment—the so-called "provocative" reaction. Persons with syphilis of the nervous system may have negative blood Wassermann reactions.

THE SYPHILITIC INFECTION.

Before proceeding to a consideration of the different phases of syphilis as they concern the dentist, it will be of service to rapidly review the successive phenomena which attend the acquired syphilitic infection.

It is axiomatic that all syphilis follows pre-existing syphilis. The presence of the S. pallida is one of the factors in the transmission of the disease. The second factor is that these organisms find a break in the skin or mucous membrane of the new host, since the spirochete will not thrive so readily on the absolutely healthy unbroken skin. The lack of continuity of the epidermis need not be more than microscopic in size, but the S. pallida will flourish and infect the individual. A third factor is that the person must be free of syphilis, because a syphilitic cannot be reinfected until he is entirely cured of his old syphilis.

Syphilis can of course be transmitted other than by direct contact. Any instrument that has come in contact with an open lesion or the blood of an active syphilitic may be the means of carrying the infection, unless sterilized by heat, chemicals, or drying. The slight wounds made by the dentists in the most casual instrumental examination of the mouth are ideal for the well-being of the spirochete because of the moisture and warmth of the oral cavity. The possibility of infection at the time of tooth extraction, because of the condition of the insulted gum, should not be minimized.

About ten to forty days after the successful implantation of S. pallida on fertile soil, the first lesion of syphilis or the chancre appears at the site of inoculation. This period without symptoms is known as the primary incubation time and is on the average about three weeks. During these three weeks the original wound of entry may have entirely healed, but the spirochetes below the surface have multiplied and invaded the neighboring lymph channels. This is proved by the fact that surgical removal of the chancre does not prevent later manifestations of the disease. It is important to remember that the Wassermann is negative during the first incubation period and during the early period of the chancre. The early period of expression of the syphilitic infection is, however, the time when the disease may be most successfully attacked, and clinical skill and the microscope should be used to make the diagnosis.

The period next advanced from the primary syphilis is the silent generalization period. The chancre is present, there are clinically no secondary skin or mucous membrane lesions, yet the Wassermann is strongly positive. The spirochetes are free in the blood at this period but no metastatic foci have had time to manifest themselves.

The secondary stage of syphilis or the stage of generalization with symptoms is the next period in the disease. The spirochetes are lodged in end capillaries everywhere in the body, and excite a varied reaction according to the susceptibility of the individual and the character of the tissue. On the mucous membrane of the mouth the mucous patch is of importance, because it is teeming with the exciting organisms and is rife with infectious possibilities. The lymph glands throughout the body are enlarged; the skin may present polymorphous lesions; the hair may fall out and papules in the flexor surfaces become hypertrophic—so-called condylomata lata. The Wassermann is always positive in secondary syphilis. About 25 per cent. of secondary syphilitics give evidence of nervous system involvement clinically or by laboratory tests.

The lesions of the secondary period may regress with or without treatment, and the patient is in the stage of potentially active syphilis. Generalized eruptions may recur, or isolated lesions manifest themselves as gummata of the skin, bone, brain, or other viscera. The Wassermann remains persistently positive or becomes negative for short periods only. The gumma forms when a localized focus of spirochetes becomes active because of some injury to the part, or other reasons which are as yet obscure. In the mouth gumma of the hard palate ulcerates and forms perforations. During this period symptoms of the nervous invasion of the spirochetes may be made evident clinically as paresis or locomotor ataxia.

Syphilis is one of the diseases which are transmitted intra-utero to the offspring. When the syphilitic marries, having had no treatment or inadequate treatment, although he presents no lesions, he more than likely infects his wife. She may never become pregnant, or she may conceive but the pregnancies are frustrated by early miscarriages; birth of dead children; living children that show all the evidence of syphilitic infection except the chancre; and then she may give birth to children that do not show any lesions until twelve to twenty years of age. The chronology is not as regular as given since living, apparently healthy children may be born between two undoubtedly syphilitic miscarriages; but it does seem as if there is some attenuation as far as the results on the newly born are concerned. Of course, all the open lesions and discharges, especially the early ones, on the congenital syphilitic are infectious. It is generally held that the infection may be carried to the third generation. Many problems of congenital syphilis still remain to be solved, and are not touched on here. It may be mentioned that syphilis is not hereditary in the sense that the disease is transmitted as one of the characters of the chromosome system. The term congenital syphilis is more fitting to the process, and less committal to a mechanism which is not fully understood.

MOUTH LESIONS.

The lesions of syphilis about the mouth are outlined briefly as they touch on the dentist's work. It may be well to quote that master of medicine who has recently passed from among us, Osler, "Know syphilis in all its manifestations and relations, and all other things clinical will be added unto you."

PRIMARY ORAL SYPHILIS.

The chancre in and about the mouth may be acquired by kissing, use of infected cups, instruments, and abnormal sexual practices. It is generally agreed that a break in the continuity of the skin or mucous membrane is essential, but it is also maintained that the active, pointed spirochete may penetrate unbroken surfaces. It is not unusual to have the chancre follow a simple lesion of the lip like a "cold-sore" if the patient has come in contact with infectious material. The chancre may be a single lesion, or it may be multiple. Usually the chancre is painless. There are several types of chancre classically described, but the special conditions of moisture and warmth about the oral cavity tend to modify these types. Secondary infection by the mouth organisms may also give an atypical appearance to the chancre. It should be remembered that the primary lesions of syphilis which have not had any antiseptics, especially mercurials, applied, will be found rich in S. pallida.

Chancre of the lip is the most common of all extragenital chancres. The lower lip is most often affected. If the lesion is in the median line it may appear double. The inner surface is less affected than the outer. I have seen no record of the primary lesion at the vermilion border.

The chancre of the gum is the rarest of the oral chancres. The danger of transmitting syphilitic infection at the time of tooth extraction should be considered possible, however. Chancre at the base of the tooth may follow manipulations, such as scraping, in which the gum may be injured by an infected instrument.

The tip, dorsum and sides of the tongue are the usual sites for chancre of this organ. A natural fissure may be infected. Many chancres of the tongue are atypical, erosive in character, but some assume the same characters as chancre of the skin.

The tonsil may be the focus for the growth of spirochetes. It has been assumed by some that all chancres of the tonsil are the result of unnatural practices. This is not the case, however. I have seen at least one chancre following an incision of a peritonsillar abscess with an unsterilized instrument. It is not so far-fetched either to consider that the tonsil may become the site of chancre for spirochetes planted on some other portion of the oral mucous membrane. Chancre of the tonsil may simulate non-specific diseases as Vincent's angina, tonsillitis, etc. One should be cautious regarding the identification of the mouth spiral organisms when examining for S. pallida.

ADENITIS OF CHANCRE.

About two weeks after the first appearance of the primary lesion the satellite glands become enlarged. For chancre of the median line of the lip, the submental group is affected, and usually the submaxillary. Bilateral submaxillary enlargement may follow chancre to either side of the median line with more enlargement to the affected side. Chancre of the lower gum is followed by sublingual and submaxillary enlargement. Primary lesion of the upper gum usually causes enlargement of the deep chain of glands probably behind the pharynx. Tongue chancres excite reaction of the sublingual and submaxillary groups. The draining glands of the tonsil are those at the angle of the jaw.

The method of gland puncture for the demonstration of the S. pallida has been advocated, since the puzzling presence of other spirochetes will thus be avoided. I have not had the success reported by others using this method.

SECONDARY ORAL SYPHILIS.

It is important to remember that the mucous membrane lesions of the disease appear prior to the generalized skin lesions of the secondary stage of the disease, because of the vascularity and character of the mucous membrane. This accounts also for the Koplic spots appearing in early measles a little before the rash of this exanthem.

Early in the clinical observation of syphilis it was not generally believed that secondary manifestations of the disease in the mouth were part of the infection. Treatises are existent claiming, for example, that all such lesions were due to the mercury used therapeutically. (In those days they gave mercury until it produced salivation.) Other gentlemen of the same early period thought that the mucous membrane lesions were not infectious. We know better now.

A generalized erythema or a mottling of the mucous membranes may be the first sign of the generalization of syphilis. Mucous patches are present in about half the cases of secondary syphilis. They may appear on the tonsil, cheek, lips, palate, and less frequently on the gums. The mucous patch is a flat lesion, rather whitish in the center with a narrow rim of erythema about it. The mucous patch may become hypertrophic and assume the character of condylomata lata. At the angle of the mouth the mucous patch becomes the split papule, because of the repeated trauma of opening the mouth. This is a most persistent lesion and is always infectious. It should not be confused with the disease known as "perleche," which simulates it closely, and which is streptococcic in origin.

Recurrent and peristent secondary lesions of the mouth are of frequent occurrence in the untreated or under-treated patient. As long as the S. pallida is present such lesions are infectious no matter how old the infection may be.

DANGER OF THE MUCOUS PATCH.

Fournier has made a summary of the dangers of the mucous patch, which I quote in full from MacKee's American Edition p. 499:

Dangers of the Mucous Patch. We may say approximately that out of ten syphilitic contaminations one is derived from the chancre against nine from the mucous patch. And how can it be otherwise?

1. The chancre has only a limited existence of a few weeks.
2. The chancre occurs only once in the whole course of the disease and is not reproduced.
3. The chancre with its induration, ulceration, and satellite bubo, is more observable than the mucous patch, and consequently more attention is paid to it.

While on the other hand:

1. The mucous patch is essentially liable to recurrence, even ten or twenty times.
2. The mucous patch is a lesion with multiple localizations, which may affect the mouth more often than the genitals, but many people believe that syphilis, as a venereal disease, is confined to the genital organs; and many thinking that contagion is only transmitted by coitus expose themselves to the risk of contagion by the mouth.
3. The mucous patch is a lesion which may occur several years after infection, even ten years after the chancre, at a time when the disease is believed to have ceased to be contagious.
4. Lastly, the mucous patch is especially dangerous by the excessive benignity which it often assumes, when it consists simply of a simple erosion. Many patients, deceived by such appearances, expose themselves to transmit contagion.

Here are a number of excellent reasons to explain why the mucous patch causes an indefinitely greater number of contagions than does the chancre.

For example, the contaminations of wet nurses is almost invariably due to a mucous patch in the mouth of the suckling. Again, the infection of married women is almost always caused by a mucous patch in the husband.

Of all the lesions of syphilis, it is the mucous patch from which the greatest number of contagions are acquired. . .

LEUKOPLAKIA.

There is a lesion of the mouth which is generally ascribed to syphilis, the so-called leukoplakia. It is a white, diffuse, somewhat raised lesion, usually on the buccal surface of the cheek, but found also on the tongue. It has been compared to the normal white patches found in the black mouths of dogs. Smoking was formerly believed to be the activating cause, syphilis the predisposing cause of these lesions. Many writers now doubt both assertions. In all probability these patches are not infectious and their importance lies in the fact that they become the site of malignant degeneration.

TERTIARY ORAL SYPHILIS.

Tertiary syphilis lesions contain few S. pallida, hence these lesions are potentially infectious. There are, however, few recorded cases. The fissures of the tongue often found in syphilitics are tertiary manifestations. There are, it should be remembered, many non-syphilitic causes of fissuring of the tongue. The textbook gumma lesion of tumor, ulceration, and punched out character of the resulting ulcer is seldom found in the mouth. Secondary infection usually causes gumma lesions of the mouth to simulate the lesions of new growth or tuberculosis. It should always be borne in mind that both these last-named lesions may appear in a syphilitic.

Gumma of the hard palate protrudes into the oral cavity. Breaking down of this gumma usually results in perforation, because of the necrosis of the bone.

It has been my experience that such perforations occur much sooner in the course of the syphilitic infection in people of the southern countries. I have seen many South Americans in New York City who showed such perforations as early as the seventh month of their syphilis. In Haiti I saw at least a hundred such perforations in the syphilis ward of a hospital. Ordinary treatment is of no avail in restoring lost tissue, and the operative measures devised are not universally successful.

CONGENITAL SYPHILIS.

The dentist will not be likely to meet the early and infectious lesions of the new-born syphilitic. They approximate very closely the lesions of the second stage of the acquired disease. He may be consulted, however, because of the dystrophies which are common in the congenital syphilitic, both in the deciduous and the permanent teeth.

Observations on the dental stigmata of the congenital syphilitic are recorded as early as 1576. The work of Hutchinson (1856) is universally known, and the contributions to the subject by Fournier are generally recognized.

The following conclusions from Cavallaro, "Syphilis in its Relation to Dentition," are quoted in full as his researches and studies have not been surpassed:

I. In hereditary syphilitic subjects the following dental stigmata are found: Erosions of the crown, cuspal erosion, and Hutchinson's tooth, white sulci, white marks; delay of development and eruption; dental infantilism, microdontism; amorphism, persistence of the deciduous teeth; anomalies of structure, shape, number, direction, arrangement, and color; vulnerability of the dental system; ectopia, total or partial absence of teeth; wearing away, premature caries, premature loss of teeth, space between teeth, diastema, and the following maxillary stigmata: malocclusion, defective articulation of the dental arches, prognathism, and cleft palate.

II. The dental stigmata are the most frequent, characteristic, persistent, and indelible among the stigmata of hereditary syphilis.

III. The erosions are systematic; they occupy the same level on homologous teeth, and a different one on teeth of a different order. Besides, they have a marked predilection for some teeth (Hutchinson's erosion in the upper centrals, horizontal grooves in the lower incisors, cuspal atrophy in the canines and first molars).

IV. The dental stigmata do not belong exclusively to the second, but are also frequently found in the first dentition. Some cases of dental stigmata in the third generation have been recorded.

V. The cup-shaped or honeycomb erosion on the deciduous molars, especially on the second, is very frequent, and we have generally found it in our observations.

VI. The dental alterations as found in idiots, backward children, etc., represent a type quite different from those found in hereditary syphilitic subjects. Hutchinson's tooth, the systematic lesions, the horizontal grooves, dental infantilism, and cup-shaped erosion in the deciduous molars are peculiar to hereditary syphilitics, while in idiots the vertical grooves and megalodontism are noted.

VII. The dental stigmata are rarely found alone (we have observed only three out of fifty-six cases); they are generally associated with other stigmata of the head or with other general concomitant stigmata.

VIII. A relationship between the factors of Hutchinson's triad, especially between the dental and the ocular lesions is very frequently found.

In fifty-six cases of dental lesions we have found in the dental follicles near the so-called auricular lesions twelve times.

IX. The anatomical and pathological examination of the dental follicles and of syphilitic teeth furnishes us with the following characteristic symptoms: Constrictions which clinically correspond to the cuspal atrophies; alterations of the enamel and dentin; interprismatic spaces, interglobular spaces, rounded islands, granulations due to an inhibitory disturbance which acted upon the tissues during the period of development.

X. In the dental follicles of macerated and doubtless syphilitic fetuses, the following alterations have been found: Endovasculitis, perivasculitis, hemorrhage, and parvicellular infiltration.

XI. The Spirochæta pallida is abundantly found in dental follicles near the so-called dental cap, in proximity to the vessels and in their walls.

XII. The dental stigmata depend upon a general morbid cause, which manifests its inhibitory action during the period of development of the tooth, *i.e.*, the second half of the intra-uterine life and the first months of extra-uterine life. Such a morbid general cause can only be syphilis.

XIII. The presence of vascular alteration and of Spirochæta pallida in the dental tissues leads us to believe that dental stigmata are of syphilitic nature and not only of indirect syphilitic origin.

XIV. The dental stigmata are of great importance for the diagnosis of hereditary syphilis, indicating the disease even before the appearance of other stigmata.

Hutchinson's teeth, the cuspal atrophy of the first permanent *molar, the multiple systemic lesions of the second dentition, the multiple and systemic lesions of the first dentition, especially the cup-shaped erosions of the molars, are pathognomonic of hereditary syphilis.* In twenty-three out of fifty-six cases, Hutchinson's teeth have been found.

XV. The maxillary alterations, although rather frequently found in hereditary syphilitic subjects, do not possess an absolute diagnostic value.

XVI. The specific treatment is always to be suggested in hereditary syphilitic children with dental stigmata, even if these stigmata are found alone and unassociated with other syphilitic or dystrophic stigmata.

PROPHYLAXIS

There should be no question but that the doctor and dentist work together on the question of syphilis, which is a danger and menace to all. It is no breach of professional ethics to inform a fellow practitioner, as dentists and doctors are, of the disease in a patient under the care of both. If either discovers or suspects the infection, the duty of both is plain.

I have mentioned above that the dentist finding a definite or suspicious lesion in one of his clients should advise immediate consultation with the family physician. The dentist for his own protection should carry out the chemical prophylactic measures advised, washing with plenty of soap and water, and the application of a mercurial. Any instrument which may have directly or indirectly come in contact with the patient should be sterilized. I would advise the dentist to delay treatment of such a case until assured by the physician that the patient was no longer infectious.

If called upon to put a syphilitic patient's mouth into good condition in order that he may better tolerate mercury in the cure of the disease, the dentist should request the physician to render lesions non-infectious by preliminary doses of arsphenamin (salvarsan), or its modifications. A dentist who is doing much of this work may be justified in using a separate chair and set of instruments for these patients. The use of gloves, either with or without first covering the hands with a mercurial ointment, is an extra precaution recommended.

The dentist should sterilize his instruments after use in every instance. Patients are keen to recognize the careful dentist in this regard, and to remember proper technique to his advantage. A sterilizer should be a fixture in every dental office, but one that is utilized.

Hasseltine in his excellent paper recommends the following methods for the sterilization of dental instruments:

1. That all instruments and appliances be rendered mechanically

clean by washing (with soap) in water with a brush or sponge.

2. That the following instruments and appliances be boiled or submitted to 80° C. in a slightly alkaline solution (0.25 per cent. sodium hydroxid):

Artificial teeth used in matching and measuring.
Broaches.
Burnishers.
Burs.
Chip blowers.
Chisels.
Drills.
Excavators.
Explorers.
Files .
Forceps, extracting.
Forceps, foil.
Handpieces of engine.
Impression trays.
Knives and lancets
Mouth gags.
Mallets, hand and automatic.
Mixing slabs.
Mouthpieces of saliva ejector.
Pliers.
Pluggers.
Pyorrhoea instruments.
Polishing points and brushes (if not discarded after using once).
Reamers.
Root elevators.
Rubber-dam clamps, and forceps for same.
Rubber-dam weights, and metal parts of holder.
Saws.
Scalers.
Scissors.
Scratch wheels on head of engine.
Spatulas, metal.
Syringes, hypodermic.
Syringes, water.
Tongue-holding forceps.
Mirror (if 80° bath to be used but not to be boiled).

3. That instruments in the above list, whose mechanical construction makes it difficult to remove excess of water, are to be placed in 95 per cent. alcohol for ten minutes to remove water, then removed and allowed to dry.

4. That only instruments with metal handles be used by dentists desiring to follow this method.

5. That the following instruments be sterilized by immersion in a 5 per cent. solution of phenol for at least sixty minutes: Mounted stones; tortoise-shell instruments; mirrors (when 80° bath is not used); other instruments not of metallic nature, and which cannot be replaced by metallic instruments.

6. That instruments after using be placed in a fluid medium, preferably clear water, to avoid drying of infectious material, and to facilitate their mechanical cleansing.

7. That no instrument or appliance used on a patient directly or indirectly be used on any other patient until recommendations 1 and 2, or 1 and 5, as the case may be, have been complied with.

Among other sanitary measures, Hasseltine mentions the use of the fountain cuspidor; a sterile sleeve which can be slipped over the cable of the power-transmitting mechanism; use of foot levers for wash basins, etc.; a clean washable covering for the operating chair; and a clean cover for the headrest, renewed for each patient. The patient should brush his teeth immediately prior to coming to the chair, the dentist giving him a brush. Paper cups and towels should be used.

TREATMENT OF SYPHILIS.

Soon after the recognition of syphilis in Europe, mercury was used as a therapeutic agent. Inunction was the favorite method of use, but oral administration and, later, hypodermic injections were used. As I mentioned earlier, mercury was given to the point of tolerance, and its toxic effects were confused with the symptoms of the disease. Mercury is still used in the treatment of syphilis.

Potassium iodid was first recommended in the treatment of syphilis about 1834 by Wallace. "Jobling and Peterson have recently explained the action of iodids, as follows: The softening and removal of caseous necrotic material from a gumma is due to tryptic ferment. The gumma, however, persists and remains firm because it contains large quantities of antitryptic substances which are of lipoid nature, being combinations of unsaturated fatty acids. Their power of antagonizing the ferment depends upon their unsaturation, which in turn can, as is well known, be satisfied by iodin, this forming the basis of the well-known index used in estimating unsaturated fatty acids. Administration of iodin by saturating the antitryptic substances destroys their power over the tryptic ferments, which then dissolve the caseous material." (Quoted from MacCallum, "Text-Book of Pathology," p. 650.)

In 1910, Paul Ehrlich (1854—1916) distributed to the heads of various syphilis clinics about the world, samples of a synthetic arsenic preparation for the treatment of syphilis. Salvarsan was the result of "606" experiments to produce a drug which has the greatest poisonous action on the cause of syphilis, and is, at the same time, almost harmless to the living tissue of the patient. Within a short time the results of the use of this drug in every possible manifestation of syphilis proved that a specific had been found. Although Ehrlich's idea that one dose of salvarsan would sterilize the patient, *therapia sterilisans magna*, has not been sustained, the drug is today our standby in the treatment of syphilis. Ehrlich did not stop with "606" but proceeded with experiments until "914," or neosalvarsan had been produced. Just prior to his death, Ehrlich produced a newer drug called "natrium salvarsan" which combined the good features of both "606" and "914." Since the war, delivery of German-made salvarsan was uncertain, and "606" has been manufactured in many other countries. In the United States, the generic term arsphenamin has been chosen to represent the chemical compound of "oldsalvarsan;" the term neo-arsphenamin was given to the product "neo-salvarsan" or "914."

There is agreement among syphilographers that the most effective time for producing radical results with arsphenamin is during the early period of the disease, and before the generalization which is expressed by the positive Wassermann, even before the appearance of the secondary eruption. The doses of arsphenamin administered intravenously vary according to the age of the patient, and the character of the manifestation. The ordinary doses vary from four to six decigrams. The maximum dose, six decigrams, should be given only to vigorous individuals, who are known to be tolerant to the drug. The doses of neo-arsphenamin are one-half greater than for arsphenamin. The maximum dose for this compound is nine decigrams. Different physicians use various formulæ in estimating dosage and the frequency of injection.

MEDICO-LEGAL ASPECTS.

The liability for the communication of diseases to a patient during dental operations is thus given by Noyes:

It is the duty of the practitioner while treating his patient, to use reasonable care and to employ reasonable skill not to communicate infectious or contagious diseases to the patient. This rule applies not only to the communication of a disease from which the practitioner himself is suffering, but also to the communication by the practitioner from one patient to another. If a dentist knowing he has such a disease allows the patient to visit him without apprising the patient of the danger and without taking proper precautions on his own part, and communicates the disease to the patient, he is liable to the patient for any damage the latter suffers thereby.

Not only is he liable for damages resulting from thus communicating a disease from which he suffers, but he is also liable if he negligently transmits a disease from one patient to another, as when having treated one patient known to him to have an infectious or contagious disease he proceeds to treat another patient without warning such patient and without taking proper precautions against the communication of the disease.

The same rule applies whether the transmission of the disease was effected through the medium of the practitioner himself, or by the use of infected instruments.

SUMMARY.

Syphilis is frequently expressed by lesions about the oral cavity. These lesions of the different stages of the disease are protean in character, that is, take various forms. The dentist should be observant of the oral cavity of each client, in order to avoid infection, and to avoid carrying the infection to other patients.

Bacterial investigation of suspicious lesions about the mouth are especially interesting because of the necessity of differentiating the non-pathogenic spiral organisms which are normally present and which simulate the Spirochæta pallida, the causative agent of syphilis.

The syphilitic lesions of the mouth are part of the general infection. The lesions here are pathologically the same as elsewhere in the body, modified by the special conditions of heat and moisture of the oral cavity and the presence of other bacteria.

The mucous patch, one of the most dangerous and persistent lesions of the disease, is present in about fifty per cent. of the secondary syphilitics.

The perforations of the hard palate, due to ulcerations of gumma of the part, are frequently found in late syphilitics. This destruction is not remedied by anti-syphilitic treatment.

The congenital syphilitic presents many lesions of the mouth. The stigmata and dystrophies of the teeth are of especial interest. They are frequent, permanent, characteristic, and diagnostic of the condition.

The dentist should observe rigid asepsis. He should take all reasonable precautions, and use more than ordinary methods of sterilization of instruments and hands during his examinations and operative procedures.

In all certain or suspicious cases, the patient should be advised to apply to his family physician, and the dentist should delay his work, if possible, until assured that the patient is non-infectious.—*Dental Cosmos.*

School Dental Clinics and Their Management

By C. Edward Wallis, L.D.S.Eng., M.R.C.S., L.R.C.P.

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HAVING been invited to contribute to this number of the BRITISH DENTAL JOURNAL some remarks on the management of School Dental Clinics, it is essential to emphasize at the outset that no plan of school dental treatment can be worked to its fullest advantage unless it is co-ordinated with the Public Health, School Medical and Education work of the area involved. In other words, if the school dental work is to be a complete success, it must be worked as part of a fully organized "scheme," and the dental clinic be regarded as an essential feature of this scheme and not merely as a place to send children with aching or decayed teeth.

It will be noticed that the word "scheme" is emphasized, and this is done advisedly, as it is not infrequently thought that *all* that is necessary is to provide a dental clinic and that the school medical inspections alone will be sufficient to keep it occupied. This experience has shown to be a complete fallacy, as the writer was able to demonstrate from some special dental inspections in the East End of London, *immediately following* the official school medical inspections.

The result, of course, as dental surgeons will see at once, was a foregone conclusion: the only cases notified for dental treatment by the school doctors were the glaring cases of oral sepsis and carious teeth usually beyond all hope of conservative treatment. Having no special training in the detection of caries, the school *doctor*s had naturally failed to detect the small, pinhole and interstitial cavities, with the result that large numbers of the children were passed by as dentally healthy who were shown next day with a probe and mirror to be honeycombed with undiscovered caries.

It is therefore plain that if we are to save teeth, the children must be properly inspected by a dental surgeon with a view to detecting and treating caries at the earliest onset, and not when the crowns of the teeth have disappeared.

School Dental Inspection.

Let us now discuss the question of school dental inspection as to *how* and *where* it is to be carried out.

The cardinal principle in school dentistry is that prevention and treatment should be developed side by side; thus the dental inspection sessions should be utilized, not only for examining the teeth, but also for instructing and generally interesting children, parents and even teachers in their care and value.

In London the actual dental inspections take place in the schools themselves, from 100 to 120 children have their teeth thoroughly inspected with a probe and mirror by the inspecting dentist at each periodical inspection session. The parents are not invited to be present at the actual inspections as it was found that their presence delayed the work, but instead they are invited to attend the last half-hour of each dental inspection, during which the inspecting dentist gives a short address—the word "lecture" is carefully avoided—on the importance of taking care of their children's teeth, with special emphasis on *oral sepis* as a cause of ill-health; this is followed by a personal talk with such parents as wish to ask questions about their children's teeth.

During the war, owing to a large number of mothers being engaged in munition work, the attendance of parents considerably fell off, so that led to the development of the plan of addressing in *addition* the elder children who are assembled for the purpose. Certain school teachers are usually present on these occasions, and can and do render the greatest assistance in obtaining the consent of parents unwilling to consent to treatment for their children.

As a class, elementary school teachers are admirable people, full of interest in their children and very appreciative when an inspecting dentist goes out of his way to explain points of dental interest, such as the seriousness of oral sepsis, the causes of irregularities, the absence of upper lateral incisors, the teeth of congenital syphilis and so forth. In this way, if a school dental inspector does his work in a deliberate, unhurried way and makes the inspection of interest to those around him, he will find that their co-operation will follow as a matter of course, whereas the opposite will obtain if the inspections appear to be perfunctory and to be got over as quickly as possible.

As each child passes the dentist the teeth are inspected with a probe and mirror and what is required is recorded in an appropriate place on the child's *medical* card by a nurse or assistant-organizer whose business it is to arrange in advance for the proper carrying out of these inspections.

No extensive dental charting is done at the actual school dental inspection, but a short note is made of the treatment required in order to enable the organizing staff to compile the lists of children to be attended at each treatment session; during the war, owing to shortage of staff, no special differentiation of the treatment required was made at the inspection, but henceforth cases involving chiefly extractions, stoppings or anaesthetic operations are recorded as such in order that the dentist may not find himself overburdened on one session and with next to nothing to do on another, owing to the process of stopping teeth taking up much more time than that of extraction.

The assistant-organizer, already referred to, belongs to a special department of the London County Council organization concerned with work of this kind and brings with her the necessary parents' consents and appointment cards, so that those present may sign them then and there, while if absent, it is the business of the organizer or a member of the School Care Committee to obtain the necessary signature of consent to treatment.

The organizer also arranges that schools and clinics are provided with special toothbrushes, tooth paste and tablets of permanganate of potash which are sold to the parents of children at cost price.

AGE FOR COMMENCING DENTAL INSPECTION.

The official Board of Education age for commencing the inspection of school children's teeth has hitherto been from 6 to 8—and consequently when a new Centre or Clinic is first opened the children inspected are of the ages 6, 7 and 8.

At the second annual dental inspection the children inspected were aged 6, 7, 8 and 9.

At the third completed dental inspection the children were of the ages 6, 7, 8, 9 and 10, and so on until every age-group is included.

All these cases are examined and re-examined as far as possible every twelve to fifteen months in each Dental Centre area.

Besides the children who attend the centres as the result of these routine dental inspections a certain number of children, not yet inspected by the dentists and sent by the school doctors, attend for treatment; these are described as sporadic or over-age cases.

The opinion of the writer is that the age-group selected for inspection and treatment of the first group, namely, 6 to 8, is really too late, and that much caries may already exist which should have been treated at an earlier age; this opinion is gaining ground, and in all probability an alteration will be made in this respect in the near future.

Though in London "infants" so-called have not been dentally inspected hitherto as part of the routine, a number of them have in fact attended the Centres for treatment, either on the advice of the medical inspectors or at the request of the parents themselves.

Unfortunately attendance at infants' schools is not compulsory, and consequently it is only a small proportion who *do* attend, and of that proportion still less obtain dental treatment (because not dentally inspected).

The London County Council have, however, recently decided that the children under the age of 6 shall henceforth be dentally examined on their entrance to school life, so that they will in future receive dental treatment when required as a matter of course.

It would be well to state here that each school dental "Centre" or Clinic should have allotted to it what one might describe as a "sphere of influence"—that is, a number of schools for the dental inspection and treatment of which it is responsible.

Thus, as it were, an irregular circle is drawn having the clinic for its centre, and including the number of schools of various sizes within its area which will enable the children to be dentally inspected every twelve to fifteen months.

The dental surgery is not used for these ulterior purposes except in one or two instances, other rooms being set aside for what is required.

ANAESTHETICS.

As regards the anaesthetics to be used, twenty-five centres in London habitually use ethyl chloride, while the remainder make use of nitrous oxide; thus during 1918, 14,000 children in London received nitrous oxide and nearly the same number received ethyl chloride.

One may perhaps here say that in the hands of a capable anaesthetist, experienced in its use, ethyl chloride is invaluable, as it enables all cases to be completed at one sitting and thus saves reappointments for extraction purposes. The only drawback is the somewhat more protracted period of recovery and the tendency to sickness in some cases, though this may be greatly minimized by proper preparation beforehand.

The scope of work at a dental clinic should involve the general principle of the greatest good of the greatest number—that is to say, a clinic dentist should so apportion his time that each child may receive the necessary treatment; cases have been known in which an undue proportion of time has been spent on one or two cases, with the result that the remaining children were sent away with little or nothing done.

The number of children seen at a London clinic at each session of two and a half hours is estimated at roughly eight to ten new cases and such old cases as may attend.

PROPORTION OF ANAESTHETIC SESSIONS

The proportion of anaesthetic to ordinary treatment sessions was originally 1 in 9, that is to say, once in each fortnight; as this number was found in many cases to be insufficient a credit of extra anaesthetic sessions was allowed to each clinic to be drawn upon as required.

It is, however, found that as the older children now attend for treatment the number of necessary routine anaesthetic sessions may reach two in each week for a whole-time clinic.

STAFF OF A CLINIC.

The success or failure of a particular clinic is largely dependent upon the personality of the dentist in charge, though it is often thought that the mere possession of a dental diploma is sufficient evidence of suitability for the post of a school clinic dentist. Experience does not support that opinion, as much tact and diplomacy is required in addition to operative ability in order to manage children and parents, particularly in these undisciplined and Bolshevistic days.

The type of dentist most suitable for school-clinic work is one who has had experience of private practice, the art of managing children and parents, and the habit of working against time.

He should be possessed of some teaching capacity in order to explain to parents the treatment required in simple, everyday language; as has already been said, school dental treatment should be preventive as well as curative, and a few words to parents may do much to excite their interest and support and thereby spread abroad the importance of dental hygiene and its relation to health.

PART-TIME OR WHOLE-TIME DENTISTS.

Speaking *broadly*, part-time, older school dentists are more satisfactory than whole-time, recently qualified young ones; it is the writer's experience that they do their work better, that their proportionate output of work is much greater from having acquired the art of working quickly, and that they obtain much more readily the ear and attention of school medical officers and teachers.

A common complaint of whole-time, recently qualified school dentists in country towns is that they are treated by the school medical officer or medical officer of health as of no account; this is probably due to their lack of age and experience, added to which their organizing and advisory capacity is for the same reason frequently conspicuous by its absence.

The younger *whole-time* school dentist usually, after a year or so, realizes that he is doing himself no good, that he is gaining no experience to fit him for private practice, and steadily losing what he knew of prosthetic dentistry when he left the hospital.

Again, whole-time dentists are to an education authority an expensive luxury as they seldom stay more than two or three years at the outside, and when another is appointed he expects a batch of new instruments, is unknown to parents and teachers, and again breaks the continuity and interest of his relations with the children and parents. A dentist already in practice is frequently *glad* of a certain income of $100 to $250 a year towards his house-rent, and so is enabled to develop his connection while doing a certain amount of part-time public dental work.

It should be here explained that though the preceding is the writer's general opinion, he is aware of a few whole-time dentists who would be an acquisition anywhere; in *each case*, however, they are men who have retired from practice in the prime of life, and have entered upon school dentistry with the priceless asset of experience in the management of patients.

In country districts, as, for example, in dealing with the school dentistry of a county, the difficulty becomes very great, as naturally dentists in practice are unable to give up the necessary time, and consequently there is practically no alternative but a whole-time appointment.

It would appear that the only way to obtain really capable men for such country posts is to offer first of all a good salary, and also the prospect of some well paid dental administrative post in later life, when the provision of public dental service increases to the extent *it must* under the Ministry of Health with its vast possibilities.

ANAESTHETISTS.

Let us consider the question of the selection of anaesthetists for dental clinic work. Here, again, it is absolutely necessary to have men who really understand the art of giving either nitrous oxide or ethyl chloride for dental purposes.

Many cases of medical men giving anaesthetics in dental clinics have been known who actually knew nothing whatever about it, and worst of all, seemed incapable of learning.

It should surely be impressed upon the councils that make these appointments that the mere possession of a *medical* degree or diploma is no evidence of ability as an anaesthetist, and that definite evidence should be produced of experience of the administration of anaesthetics for dental purposes.

Dental Clinic Nurses.

It is essential that a nurse should be provided to assist the dentist at a clinic, and one should be selected who is not only accustomed to the management of children and parents, but who is also willing to help in the mixing of stoppings, sterilizing and custody of instruments, and so forth; on anaesthetic days the presence of an extra nurse is necessary to take charge of the recovery room.

An attendant or caretaker who can keep troublesome children in order in the waiting-room is also essential, and who, when the clinic is closed, should be responsible for the general cleaning, and so forth.

Following Up.

Mr. Norman Bennett, in his admirable report to the Board of Education, gave it as his opinion that the "following up" should be done by nurses and not by lay persons, and in this matter the writer is in entire agreement; the visitation of a nurse in uniform is seldom resented by a parent, while the visits of lay people without uniform are said to excite opposition. This following up by school nurses is specially advantageous when the visiting nurse is also the nurse who assists the dentist at his school dental inspections and treatment, and who is therefore already known to many of the parents and guardians.

Supervision of Work.

Where there are several clinics in a town or district, it is essential that a *supervisory dentist* should visit the clinics periodically, and also see to it that the work of the clinics is properly co-ordinated; the plan of leaving clinics to themselves and merely counting up the number of extractions and stoppings is by no means a satisfactory way of assuring that good work is being done.

Preventive Dental Treatment.

Let us draw attention to a valuable development of school dentistry, which has been initiated by Fones, Director of School Clinics in Hartford, Connecticut.

It consists of the employment of trained women known as dental hygienists, who pay routine visits from school to school in order to carry out the surface treatment of children's teeth.

Fones declares that if teeth are thoroughly and skilfully cleaned at suitable intervals 80 to 90 per cent. of dental caries can be prevented—in other words, it is what the Americans call "prophylaxis" applied to school children.

No operative work of any kind is done by these women dental hygienists beyond the surface "toiletting" of the teeth of school children.

New York has now started a similar service on the same lines, and as Fones has had this dental hygienist work recorded on cinema films, before long we may be able to show what is actually done *on the screen.*

INFANTS' AND MOTHERS' WELFARE CENTRES.

Attention is here drawn to the advisability of the development and co-ordination of mothers' and infants' welfare centres in connection with school clinics for the treatment of expectant and nursing mothers and infants not yet attending infant and nursing schools.

It is quite possible to set aside *one or more afternoons* in each week for this purpose, and experience shows that if properly worked they are of the greatest benefit, as we all know the teeth of expectant and nursing mothers of the poorer classes are beyond description and urgently calling for treatment if the children of the future are to have a fair start in life.

It is also possible to arrange for expectant and nursing mothers after treatment has been completed to be supplied with dentures on a system of payment by instalments.

Under the new Ministry of Health great development must undoubtedly take place in regard to the school dental treatment of children, and it therefore behooves all interested in public work to gain a general knowledge of the experience already obtainable.—*British Dental Journal.*

ANNEALING.—Gold or copper plate heated to redness and then dropped into alcohol will be softer and cleaner than when water is used.

REMOVING SILVER NITRATE STAINS.—Many times, even though one be very careful, a little silver nitrate will fall on the hands of an operator and cause a great deal of discoloration and also discomfort in operating. When this happens soak the hands for about fifteen minutes in water as hot as one can stand, and then very carefully rub the spots with pumicestone. The spots will be seen to disappear without any injury to the part treated. After the black color caused by the dead skin entirely disappears, soak the hands in almond cream. Very large spots may require a few treatments at short intervals before the black color entirely disappears.—*W. E. Whittaker*, (*Dental Cosmos*).

THE COMPENDIUM

This Department is Edited by
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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

Occupational Dental Ailments.

CHILDREN attending our primary schools come under the care of both medical and dental experts. Excellent results have attended this innovation. Unfortunately a large proportion of boys and girls leave school at an early age and seek employment in offices, warehouses and factories. To these places, in a large number of instances, the medical inspection in some form follows; because the employer knows the value of a healthy employee. Many of our large industries have established complete medical clinics for the workers.

In any case where an accident has occured to an employee, or where there has been loss of a limb, there are statutory measures that provide some compensation. Such laws go a long way towards protecting workers, and no doubt from time to time amendments and additions will be made so as to still further extend this protection.

Admirable these provisions undoubtedly are, but there is still room for better protection of the youthful worker, especially those whose parents or guardians for selfish motives thrust them into any job however dangerous and unpleasant, having regard only for the wages earned. Take for instance the large number of children who work in candy and gum factories, where sugar is used in large quantities; unless they are warned and watched carefully, they soon develop numerous cavities in the teeth and have to make constant visits to the dentist. Ordinary prophylactic measures such as cavity filling do not suffice—the teeth seem to melt away even with the best dental attention, and in a few years complete loss of the teeth may result. Now the question is: Has any employer of labor the right to place these children at work of such a nature, knowing that it will have disastrous effects upon the worker? If measures have been provided by parliamentary statute to compensate workers for the loss of a limb caused through the nature of their employment, why should they not be protected against the loss of their teeth?

How often do we observe the condition of erosion in the teeth of those who work with acids—lithographers, workers in hides, metal-platers, etc? Something should be done to protect these people. Prophylactic measures of some sort would prove of inestimable value.

To the dentist whose work is with industrial classes, the evidence of particular types of employment as shown in the teeth, is so marked that he seldom asks the patients where they work. The fact is plainly evident. To him it is a source of wonder that nothing is done to stop this destruction.

There is another, and a very interesting side to this question. Workers in certain industries show decided immunity to dental caries. An examination of the teeth of coal-gas workers, packing-house employees, workers in brass, etc., will result in some very interesting data being obtained.

It is obvious to even the casual observer that something should be done to protect the youthful wage-earner so as to render the dental services received in our primary schools of lasting value. It is little short of a crime that a young girl who takes good care of her teeth, should be forced by circumstances, mercenary or otherwise, to take up work of such a nature that in a very short space of time tooth destruction will result. No wages paid her will compensate for such a loss, to say nothing of the pain and discomfort experienced. It is up to us as a profession to take the initiative in this matter. There is no doubt that in the majority of cases the employer will co-operate.

NOTES ON INTERPRETATION OF RADIOGRAMS.

By B. F. Gray, D.D.S., in The International Journal of Orthodontia Vol. VI., No. 2, P. III.

RADIOGRAMS are quite commonly regarded as a record of shadows on the photographic film or plate. If we interpose an object between the source of light and the screen, a shadow is cast; the greater the light penetration the weaker is the shadow. A cloud passing over a hillside throws a shadow which is of a greater or less degree of intensity according to the penetration of the sun's rays.

In the radiogram the picture is wholly dependent on the degree to which the X-rays penetrate the object interposed between the tube and the sensitive film. In the case of the cloud, the greater the light penetration, the weaker the shadow; in the radiogram, the greater the penetration of the X-rays, the deeper the shadow. Therefore, the tone of a radiogram, whether dark or light, black or white, depends upon the resistance of the tissues through which the rays pass.

Assume a normal maxillary bone. Lay back the soft tissues over the apex of a cuspid tooth; remove the boney tissue at the apex; put in place the thin layer of bone and stitch up the soft tissues. A radiogram of this tooth may reveal an area at the apex very dark indeed. But it is not due to any pathological process at all. It is merely due to the lessened resistance of a certain portion of bone to the X-rays. The worst sort of streptococci infection—the most clearly defined "granuloma" might look no more dangerous than the radiogram we secure from such an experiment.

If we do not keep the rationale, i.e., the photography, the physics and the technic of the work in mind, we have no proper basis of interpretation. We may find ourselves reading disease—pathology—into practically every radiogram we observe. We see in certain radiograms of the teeth very decidedly black lines following the outline of the tooth in its socket, and are apt to say that these demonstrate pathological conditions, whereas it may simply mean that the investing membrane of the tooth and alveolus permits a relatively more rapid passage of the X-rays at that immediate point than elsewhere, and the picture would have no pathology significance.

The most difficult teeth to picture radiographically are the maxillary molars, and pre-molars, due to the misleading and trouble-making maxillary sinus and also to the molar process, and further, to the difficulty with which a film may be properly placed and held in position. Sometimes the maxillary sinus may be interposed between the tube and the film because of the angle at which the picture is taken. Large enclosed dark areas show about the roots of the teeth, and are sometimes interpreted as showing the penetration of the floor of the antrum by the roots. Very rarely will a picture show conclusively the penetration of the antrum. Stereoscopic radiography may perhaps solve the difficulty of correct reading of pictures where the tube is placed so high that the rays pass through the antrum before they reach the roots of the molars. By means of stereoscopic radiography it may be possible to establish a real perspective in the radiogram. We must learn to know what these antral shadows look like, and we must learn to make exposures at different angles, so as to eliminate these shadows as much as possible from the field we wish to critically observe. We need to differentiate between shadows and so-called "areas"—to detect significant records or shadows within these antral shadows.

Small areas about the apex of a tooth may be quite as dangerous as large areas because a family of several millions may be localized in that small area, and be a source of infection. A so-called "dead tooth" may show no area at all, yet be the cause of trouble. A radiograph will not show an area until degeneration of the tissues occurs. The time required for such degeneration varies greatly with different cases. We may fill a root canal thoroughly, and then take a picture, all looks well; but after a time the degenerative process may set in and then the area is apparent. Only careful and long-continued investigation of this subject will help us in placing the correct values upon these pictures.

TREATMENT OF ACUTE SEPTIC GINGIVITIS.

BY ALBERT B. CROCKER

In "The British Dental Journal."

A SIMPLE but efficient method of treatment for this disease is suggested. The usual routine of scaling, removal of septic roots, use of antiseptic mouth wash, iodine, etc., is first resorted to; then the patient is instructed to syringe the gums two or three times a day with a potassium permanganate solution (1:5000) "the color of pink blotting paper." This description will serve nicely for a guide as to the strength of the solution. A four-ounce glass or an ear syringe with a fine nozzle may be used to apply the solution. It is of prime importance that a good deal of force be applied when syringing the tissues and for this purpose it is best to hold the syringe away from the mouth a distance of about a foot. In this way there will be sufficient pressure to free the tissues of pus and other materials. Particular attention should be given to the areas between the teeth and especial effort used to wash away the sloughs and grayish membrane.

It is claimed for this treatment that a wonderful improvement will be observed even in two or three days; the painful condition of the gums ceases; the foul odour of the breath disappears and the tissues take on a healthy appearance. The explanation of this rapid improvement may be explained as follows:

(1) The organisms which cause acute septic gingivitis, viz., fusiform bacilli and spirochaetes, are easily washed out if enough syringe pressure is used.

(2) Other organisms if left about the tissues are killed by the oxygen from the potassium permanganate if this wash is frequently used, because these germs are an anaerobic, and also they will not flourish in the absence of necrosed tissue.

(3) The force of syringing acts as a stimulant to the gums and the blood supply is increased.

THE HYPODERMIC NEEDLE.—Before inserting the needle, apply a drop of chloroform to the skin; it is antiseptic and anaesthetic.—(*F.P.*)

PULP EXTIRPATION.—Where immediate extirpation is intended, if a pellet of cotton is placed over the rubber in the cavity, a much better pressure can be obtained, as the cotton prevents the rubber from spreading so much under the instrument.—(*W. A. B.*)

Fear

FEAR is the greatest handicap that humanity has. There is nothing so demoralizing, so weakening, so disintegrating, as fear. It saps the energies and paralyzes the impulses. It incapacitates the individual who gives way to it, and leaves him limp and useless. It destroys ambition, and develops lethargy. Fear is the canker that undermines a man's usefulness and renders him a prey to all the goblins of despair.

Fear and doubt and dread, with all their miserable train, do more to keep humanity from coming into the full fruition of its powers than any other single element of our existence.

To be afraid is to court defeat; to put on a bold and resolute front is halfway to winning. The coward never accomplished anything of merit—that is, the real coward. There is a difference between cowardice and caution, and the cautious man is not necessarily a coward. Caution is essential in many of the exigencies of life; but cowardice, never.

To go through the world with constant fear in your heart is a nightmare; to look the world bravely in the face and accept the inevitable with a resolute mien is to see the sunlight. Many a man has been a failure in life merely through fear. Fear is not constructive in any way—it always destroys.

If you have done wrong, face the result, but do not cringe or crawl like a whipped cur, as if your crawling would right the wrong. The only fear you should have is that you may do wrong again. We all make mistakes, we all do wrong. The essence of our individual progress is that we learn by a mistake not to make the same mistake again, or by a wrong that we shall not commit the same wrong the second time.

We are not endowed with omniscience, nor are we perfectly balanced morally; otherwise we would not make mistakes, nor would we do wrong. Why, then, shall we permit fear to haunt us because we have made a mis-step?

Fear was implanted in the human heart ages ago, and it will take ages to eliminate it. The basis of most of it was superstition, and superstition is not all dead yet. The farther a man gets away from superstition the better it is for him, and the more nearly free he is from fear. The best example I know of an absence of superstition and an absolute lack of fear is the bulldog. Study him; it may do you good. He never looks for trouble, and he never avoids it when it comes; neither is he ever afraid of the consequences.

When humanity is emancipated from fear it will be a happier world, and there will be less weeping and wailing and gnashing of teeth. Also, there will be more rapid progress toward the higher achievements of life, and a surer foundation upon which all real advancement is made.

C. N. Johnson.

More Hurry, Less Speed

NEXT time you promise that "hurry-up" prosthetic case, allow sufficient time for the laboratory service. It is claimed by laboratory men that some practitioners "don't allow time for the plaster to harden."

Limitation of Use of Anesthetics

AT the May meeting of the Medical Society of the District of Columbia the following resolution was adopted:—Resolved, that the Medical Society of the District of Columbia go on record as in favor of the limitation of the practice of anæsthesia to regularly licensed physicians and surgeons, and dentists, and graduate nurses in cases of emergency, or medical students for the purposes of instruction.

ORAL HEALTH

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Vol. X. TORONTO, JULY, 1920 No. 7

EDITORIAL

Government Tax Upon Prosthetic Appliances Made in Dental Laboratories

THE Dominion Government recently adopted regulations providing for a levy of one per cent. upon all articles manufactured in Canada. Ottawa Inland Revenue officers have now ruled that such tax applies to the manufacture of dental appliances for use in the mouth. The dental laboratories are required, therefore, from the 19th of May, 1920, to pay to the Government of Canada 1 per cent. upon the net invoice price of all work made by them.

A few of the local Inland Revenue officers, who are doubtless over-zealous, have suggested that this tax is also applicable to prosthetic restorations made by the individual dentist in his own office. This is a rather extraordinary suggestion, as a dentist makes nothing for sale. He charges only for services rendered. It would be impossible to disassociate the service performed by the dentist for the patient at the operating chair from that performed for the patient in the laboratory. The entire procedure when carried out by the dentist is dental service, and in no sense a process of manufacture. Where local officers make such rulings it would be well for dentists to point out the facts of the case and, if necessary, make an appeal to higher authority. From the dental standpoint important principles are involved. Should the Government determine upon a levy to be made upon the pronfessional charges of physicians and dentists, that would be an entirely different matter.

A tax upon the manufacture of dental prosthetic appliances may, under the circumstances, be defendable. It is, however, very questionable whether any tax is ever justifiable when levied against a service vitally affecting such an important national asset as the health of the citizen. Such a tax could hardly be said to be a "luxury" tax. And it surely was not the intention of the Government to place a tax upon the health services of the country.

Book Review

GENERAL AND DENTAL PATHOLOGY, WITH SPECIAL REFERENCE TO ETIOLOGY AND PATHOLOGIC ANATOMY. (A Treatise for Students and Practitioners. By Julio Endelman, M.S., D.D.S., Professor of Special Dental Pathology, College of Dentistry, University of Southern California; Editor of the Pacific Dental Gazette; member of the Southern California Dental Association, the California State Dental Association, and the National Dental Association; Corresponding Member of the Societe Odontologique de France; Honorary Member of the Sociedad Odontologica de Chile, S.A., etc.; and A. F. Wagner, A.M., M.D., Professor of General Pathology, College of Dentistry, University of Southern California; Pathologist and Autopsy Surgeon of the County and City of Los Angeles, Member of Los Angeles County Medical Society, California State Medical Association, American Medical Association, etc. The C. V. Mosby Co., 1920, St. Louis.)

A LONG-FELT want will now be filled by the publication of this valuable book, which contains in one volume both dental and general pathology. It conveys in the briefest manner the results of years of careful research on a given subject. It impresses such knowledge upon the reader's memory. It vividly draws forth the close relationship between the diseases of the teeth and disease in general. Not the least of its merits are the concise definitions, which are of inestimable value to the student.

This thoroughly useful book contains 573 pages, 362 pages being devoted exclusively to dental pathology. There are 440 illustrations, of which 340 in the section on dental pathology are original, and four colored plates.

Part I is general; the etiology of disease, pathologic processes, the circulatory changes, inflammation, progressive tissue changes, tumors, infectious diseases are clearly defined and explained. A most interesting chapter on malformations is contributed by Dr. J. Walter Reeves, formerly Professor of General Pathology in Dental Department of the University of Southern California.

Part II opens with an introductory chapter on dental diseases. Two chapters are devoted to normal histology and the development of the teeth. The etiology, the macroscopic and microscopic features of the following phases of the subject are masterfully handled: Hypoplasia, abnormalities in form and number of the teeth, Hutchinson's teeth, hypercementosis, abrasions and erosions, the gums and gingivæ, calcareous deposits, the peridental membrane, bone, periostitis of the jaw, mouth infections in relation to systemic diseases,

An interesting and valuable chapter is written on saliva, from both the normal and pathological standpoints. Chapters on pyorrhea alveolaris, acute and chronic dento alveolar abscesses, diseases of the pulp, and dental caries, contain material of exceptional merit. In the chapters on dental caries, Professor Gies, of Columbia University, is quoted freely.

Of great interest also is a chapter on cystic odontomas, by Dr. G. B. New, of the Mayo Clinic.

This book is really a compendium of many other works, and presents the subject matter in an original and readable way. The student will have his memory systematized by the use of this text, and the practitioner will certainly find it a desirable asset to his library.

W. C. R.

Attend the Canadian Dental Association, Ottawa, 17th, 18th, 19th August, 1920

EVER feel a lot better when you told a friend your trouble? Remember how relieved you felt in your boyhood days when you got it off your chest to "someone who understood"? You'll do just that at the C.D.A. (perhaps unconsciously), and acquire that feeling you used to have after four o'clock on the last day of school in June.

The Constitution and Bylaws of the Canadian Dental Association will also be brought up for discussion and ratification at this meeting. They make the C.D.A. the "Federal House" or "Supreme Court" of dental society organization in Canada. In the light of present day conditions it is essential that dentistry as a profession be able to present a solid front and be properly organized.

Is the Physician in your town a "Wholesale Extractionist"? If so, has he any more right to dogmatically diagnose dental conditions than you have to order the removal of an appendix?

How can you obtain his co-operation and more intelligently collaborate with him?

Come to the Convention and *find out.* It will be discussed. *It's worth coming for.*

S. G. McCaughey,
Chairman Publicity Committee.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, AUGUST, 1920 No. 8

Cast Gold Inlays*

By Robert E. Blackwell, D.D.S., Chicago.

PERHAPS there has been no one thing in the whole range of dental operations which has fastened itself so strongly upon the profession and been adopted so universally as has the cast gold inlay. Its possibilities, immediately recognized, now are well on the way toward complete development. And yet it is not a perfect thing today. Either certain physical phenomena are not fully understood, or, if they are, methods have not been perfected to counteract them.

In the preparation of this paper, the writer has not attempted to go into the details of the physics involved in the making of a cast gold inlay; neither does he claim to present anything new in the process of inlay construction. But some suggestions will be made, which, it is hoped, will lead a few to improve the character of their work.

Cavity preparation is such an important part of inlay construction that it must be given careful consideration. If there is any one step upon which the success or failure of an inlay rests, it is in the preparation of the cavity which is to receive the filling. Let us consider a proximo-occlusal cavity in a molar tooth as one in which an inlay definitely may be indicated. Caries usually begins just gingivally of the contact point upon a perfectly smooth surface. In determining the outline form of the cavity, it is necessary to consider several factors which tend to limit the spreading of decay or have the opposite tendency of permitting decay to spread widely upon the surface. In a normal occlusion, a cusp from an opposing tooth drives food into and through the embrasures between two

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(Read before the Toronto Dental Society, March 15, 1920) proximating teeth with every closure of the jaws in mastication. This subjects a portion of the proximating surfaces of the teeth to natural cleaning by the friction of mastication and insures the axial angles against superficial caries. If the occlusion is such that there is no interdigitation of the cusps, natural cleaning of the proximal surfaces will be less effective. If the proximal surfaces of the teeth are well rounded and diverge rapidly toward the axial angles, widening the embrasures considerably, food will scour these surfaces and limit the spreading of decay to a narrower area buccolingually. On the other hand, if the proximal surfaces are flat, making broad surface contacts, or near contacts, and the embrasures are correspondingly narrow, superficial decay well toward the angles may be expected. Caries beginning in the protected position, gingivally of the contact point, will spread on the surface of the enamel until further spreading is prevented by natural or artificial means. The colony of microorganisms whose acid waste products dissolve the calcium salts of the tooth, will cease to spread when it has reached that portion of the tooth surface which is habitually kept clean by the abrasion of mastication. Just where these lines of immunity are, to the buccal and lingual, should be determined in each case. The conditions probably are never twice alike. But in these immune areas the cavity margins must be laid, if further decay is to be avoided. Gingivally, the healthy gum tissue will prevent spreading of caries; and its position, when normal or nearly so, will determine the location of the gingival margin of the cavity.

The resistance form of this class of cavity is provided by a broad, flat pulpal wall and a flat gingival wall, both of which are cut to definite angles with their surrounding walls. Some emphasis should be placed upon the desirability of a flat gingival wall. (Fig. 1.) It is this portion of the cavity which underlies the occlusal marginal ridge of the filling. The ridge is repeatedly subjected to the heavy stress of mastication. If we intend that our inlays shall stand the test of time, as gold fillings have, it will be necessary to look closely to the seating of them—the resistance form. The

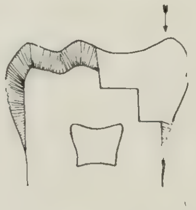

Figure 1.

Section of molar tooth cut mesio-distally in the axial plane. Arrow points to marginal ridge of inlay which should have the definite support offered by a flat gingival wall.

occlusal marginal ridge requires the immediate and permanent support of a flat gingival wall cut to definite angles with buccal, lingual and axial walls. The occlusal step offers great rigidity and stability and with a little widening in the form of a dove-tail in the grooves which offer the best opportunity for such cutting, ample retention form may be secured to provide against tipping stress. (Figs. 2, 3 and 4.)

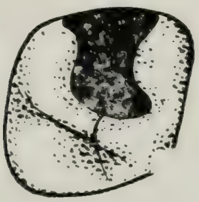
Fig. II.

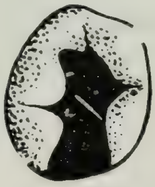
Fig. III.

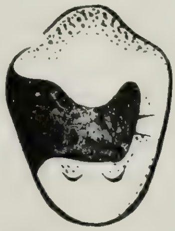
Fig. IV.

Figure II.
The finished filling, which shows best the wide outward inclination of the mesial portion of the buccal and lingual walls.

Figure III.
The occlusal surface of the tooth after the filling has been finished, showing the outline form of the cavity from that view.

Figure IV.
The occlusal surface of the tooth after the filling has been finished.

Convenience form for inlay cavities consists in the removal of all undercuts and the tapering of cavity walls to permit of the easy removal of the wax model and the insertion of the inlay. A good deal has been said about the amount of taper required in inlay cavities. It is the opinion of the writer that the taper should not be great. If the wax model, when perfectly adapted and trimmed, moves easily in and out of the cavity and may be returned to the cavity with all margins snugly fitting, then the taper is sufficient even though the walls may be nearly parallel. The axial wall, or in a mesio-occluso-distal cavity, the axial walls, should have at least as much taper as the surrounding walls. The success or failure in the adaptation of the cast inlay to the cavity depends more on the perfect removal of undercuts and the careful planing of slightly tapered walls than upon any other one thing. Any time taken in the proper shaping of walls is well spent and often will save time in the end.

Is it necessary to say that all carious dentin should be removed? In the light of some recent literature, it would seem that it is.

The enamel wall should be planed smooth with keen-edged chisels and enamel hatchets, and a distinct bevel to the cavo-surface angle should be made with the same instruments. Gingival margin trimmers of appropriate angle should invarably be used to bevel the cavo-surface angle of the gingival enamel wall. (Fig. 5). In no case should stones or sand paper discs be used in the finishing of the enamel walls. The "teeth" of the finest stone even, are so coarse in comparison to the diameter of enamel rods that many short, unsupported rods will be left standing, which are likely to fall away subsequently and leave an imperfect margin. When stones are used to cut off tips of cusps or other large portions of enamel, the final trimming invariably should be done with sharp hand cutting instruments.

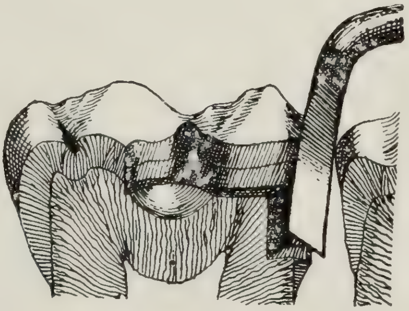

Figure V.

The gingival margin trimmer in position giving a slight bevel to the gingival cavo-surface angle. Notice particularly the angle of the cutting edge of this instrument and its adaptation to this work. The pair of gingival margin trimmers designed for use in distal cavities serve equally well for that position.

In this paper, the writer does not intend to discuss the merits of various waxes. There are many good ones on the market, and for that reason it seems advisable to suggest that the one you know the most about is the one to use. Neither does it seem wise to attempt to dictate the method of softening the wax. It is the writer's preference to soften the wax over the flame so that one part may be softer and more yielding than the other; but many men obtain good results by softening the wax in hot water. That wax shrinks upon cooling, there can be no doubt, but that it should of its own selection shrink more in the gingival region than in the occlusal, seems absurd. The reason for this contraction must be in the lack of condensation—the denser part shrinking less than the other. To remedy this, select a piece of wax several times as large as required to fill the cavity and soften it over the flame until it can be moulded into a wedge-shaped piece with the thin part much softer than the rest. Place this in the cavity in such a way that it will not meet resistance from any other source than the gingival wall until the latter has been completely covered and the soft wax has spread to all angles. (Fig. 6.) By the application of continuous, steady pressure always in the same direction, all parts of the cavity will be filled completely and the wax thoroughly condensed by the even pressure of thumb or finger on the more solid excess wax. Continue this pressure until it is certain that the wax has cooled to mouth

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Note: Illustrations Nos. 2, 3, 4, 5, 8 and 10 are taken from Black's Operative Dentistry, Vol. 2, and we are indebted to the Publishers for their use.

temperature; then carve to form. Burnishing the wax toward the margins favors condensation and adaptation, and partly compensates for loss of volume due to contraction while cooling to mouth temperature. The pattern now should be removed and examined to see whether all angles of the cavity have been accurately copied, and all margins well defined. This examination of the wax model frequently will disclose errors of cavity preparation which must be rectified. Perhaps the gingival wall is not flat or the occlusal retention is insufficient. If errors are discovered and corrected, it will be necessary to make a new start with a new piece of wax. If, however, the wax model shows the cavity to be satisfactory, it should be dried and the pattern re-inserted for the final trimming. A thin, flat burnishing instrument should be passed between the wax model and the proximating tooth burnishing bucally, lingually and gingivally. At the same time the model must be held securely in the cavity. Contact of the model with the proximating tooth is not necessary and usually is not desirable. The model now may be lifted from the cavity on an exploring tine and held in the hollow of the hand while affixing the sprue wire. If the latter is held in the naked fingers while being heated and affixed, the possibility of warping the model or otherwise injuring it with too much heat will be reduced to the minimum. Place the sprue wire on the

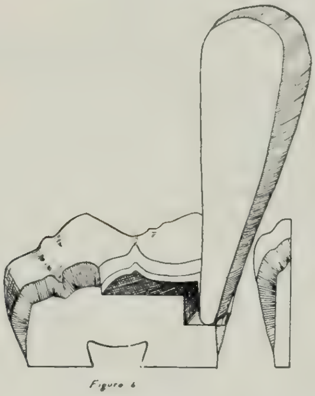

Figure VI.

Section of proximo-occlusal cavity in molar showing section of wedge shaped piece of wax in correct position.

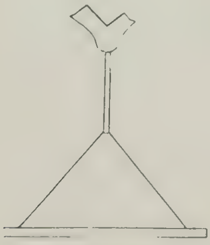

Figure VII.

proximo-occlusal angle of the model in such a way as to bisect the angle. (Fig. 7.) The model should be cleaned with a fine brush and alcohol to remove oil and saliva, after which it should be invested as soon as practicable.

In the opinion of the writer, the best results are obtained by a method of investing and casting which has been advocated by Dr. R. H. Volland. Briefly, it is as follows: As thermal changes may influence the volume of wax in the model, or tend to warp the model, the temperature of the investment material and the water used to mix it should be uniform and not extreme. A mix of investment material at room temperataure is preferred and can be readily made if a can of investment material and a bottle of water are allowed to stand side by side on the laboratory bench at all times so that each is at approximately room temperature. Mix the investment to a thick creamy consistency with slight spatulation, and, with a fine camel's hair brush, paint the investment on the wax. Place the ring in position and pour the ring full. Do not tap the ring to settle the investment, as that will cause bubbles to rise from the bottom, some of which will settle on the cavity side of the wax model.

The binder in all investment materials is plaster of Paris, which holds the more highly refractory materials together. As 350° F. is approximately the temperature at which plaster of Paris begins to disintegrate, it is very desirable that the investment should not be heated above that temperature. The Bunsen flame should not come in contact with the ring or the investment, but the ring, turned open end down, should rest upon a wire platform which in turn is supported by sheet metal, the latter protecting the ring from the flame. An electric plate is preferred but is more expensive to operate, and with a little experience the Bunsen flame can be controlled so that the investment will always be at the right temperature—about 340° F. An ordinary vulcanizer thermometer set into an inlay ring filled with investment may be kept on the wire platform with the inlay rings. A few thermometer tests readily will determine the amount of flame required and the gas cock can be opened to the same position each time. To dissipate the wax for an average sized inlay, requires an hour and a half to an hour and three quarters at a temperature of 340° F. A little more time at the same temperature will do no harm. When sufficient time has elapsed, allow the ring to cool to room temperature and cast.

Good castings can be made by various methods, but the centrifugal machine is preferred because of the uniform pressure and the opportunity to cast molten, but not superheated, gold into a practically cold mould. The gold should be heated until it spheroids, and the film-like covering of the molten mass breaks and falls away. Then cast. It is not necessary or desirable to heat the gold until it "spins." Immediately after casting, the ring should be cool enough to be comfortably handled with the fingers.

If this method is followed, smooth castings will result. They will not be flaky or rough. A rough casting is usually due to over-heating the investment or super-heating the gold, or both. When this method is followed, it will be found that the investment is hard and strong after casting; but when damp it will peel away from the gold in large pieces, leaving a somewhat blackened inlay. However, when the gold has been washed and pickled, it is clean and smooth.

When the inlay is placed in the cavity there will not be contact with the proximating tooth, as the wax contact was cut away while the model was being burnished. Therefore, the inlay may be forced into place immediately without much trimming, and it may be determined at once whether or not it is a success. As the higher carats of gold are quite soft, it is necessary that the contact point shall be restored with solder, to insure a permanently well-rounded contact point—one that will not be flattened by inter-proximal wear.

The form of the contact point should be smoothly rounded, and it should be placed in its normal position, a little to the gingival of the crest of the marginal ridge. (Fig. 8, A.) Dr. Black has stated that the contact point should be as two marbles touching each other. This means that there should be a rounding away of the proximal surface of the inlay in all directions from the point of contact. A great many contact points are placed so far to the occlusal that the margins of the filling do not receive the natural

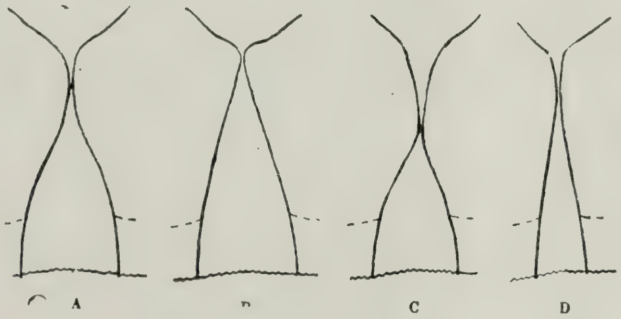

Figure VIII.

Good and bad forms of proximal contacts, buccal view. The proper position of the contact point for bicuspid and molar teeth is about as shown in A, just a little to the gingival of the marginal ridges. The convexity of both surfaces at this point should generally change to a slight concavity in the gingival direction.

The position of the contact in B is too far occlusally. With such a form of contact, less than the normal portion of food will pass through the embrasures, and the exposed portions of the proximal surfaces of the teeth will not be normally cleansed in mastication.

The position of the contact in C is too far gingivally. The long approaches from the occlusal invite the wedging of food between the teeth, with the danger of forcing the contact open.

The position of the contact in D is about right, but the teeth have not been separated to restore the normal mesio-distal width of the interproximal space.

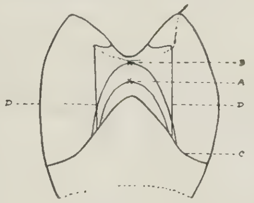

Figure IX.

Proximate aspect of an upper bicuspid.

A indicates correct position of contact point as seen from the buccal in Figure 8, A. B indicates contact point too close to marginal ridge as in B, Figure 8. C indicates the position of the septal tissue. D indicates probable position of cavity margins. Note the difference in size of the unclean area as indicated by the curved lines running bucco-gingivally and linguo-gingivally from the contact points. It will be seen that the filling margins are safer when the contact point is placed gingivally of the ridge.

cleaning which they should. (Fig. 9, B.) For, when the contact point is placed, say, a millimetre gingivally of the crest of the marginal ridge, the proximating marginal ridges are thrown farther apart, thus forming a larger opening between the inclined planes of the ridges (Fig. 8, A), which will accommodate a correspondingly large amount of food to be separated by the contact point and forced through the buccal and lingual embrasures by the cusps of the opposing teeth. Also the area not scoured by food will be made more narrow bucco-lingually, and the margins of the filling will be more certain of being kept clean by natural means if the contact point is in its normal position. (Fig. 9, A.) When the contact has been adjusted to proper form (Fig. 10) and tightness, all the margins should be thoroughly burnished by heavy hand pressure with suitable instruments before setting. After cementation the margins should be finished with sand paper discs and strips; but

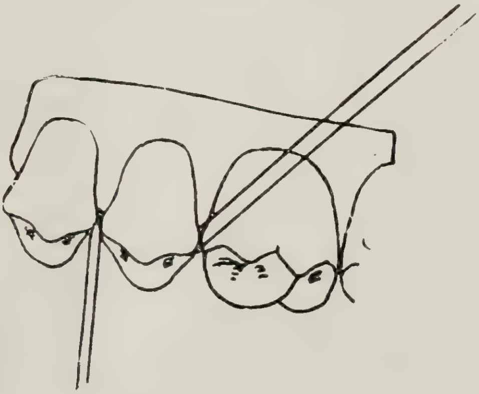

Figure X.

In testing a contact the ligature should be first carried through from occlusal to gingival, then the two ends of the ligature should be held parallel in the occlusal direction, as shown between the two bicuspids; the distance between the strands will indicate the bucco-lingual width of the contact. The two ends should then be held parallel in the buccal direction, as shown between the second bicuspid and first molar; the distance between the strands will indicate the occluso-gingival width of the contact. In either position, if the parallel strands are more than from 1½ to 2 mm. apart, the contact is too broad.

burnishing should not be resorted to on account of the likelihood of fracturing the hardened cement.

Perhaps there is no single plan or mode of procedure which could be adopted by all with certainty of a high percentage of success. Two equally skilful dentists might attempt operations of the same kind and follow the same technique step by step. One would obtain a splendid result, while the other would have to accept mediocrity as his best. And yet it may be that slight changes in technique for the latter would have made possible a perfect operation. The technique for making cast gold inlays, which has been briefly described, seems to be the one for the writer to use. Since the adoption of this method his inlays have been much improved.

Our attention repeatedly has been called to the fact that there are but two important diseases of the mouth which dentists are constantly required to treat. One is caries, which, if not checked, will lead to alveolar abscess; the other is gingivitis, the forerunner of chronic suppurative conditions of the peridental membrane, commonely called pyorrhea. The relation of cast gold inlays to these conditions should be considered.

The complete prevention of caries by prophylactic treatment has not been accomplished. Our best hope for the preservation of pulps seems to be in the early discovery of caries and treatment by means of fillings. The cavity preparation for gold inlays, particularly in the bicuspid and molar region, can be so executed as to leave a larger amount of dentin covering the pulp, in many instances, than can be allowed in preparations for other fillings. For this reason the pulp is comparatively safe from death due to thermal changes. This is particularly true of the proximal portion of complex cavities in molars. Frequently in deep cavities when the buccal and lingual dentin walls are made parallel to afford retention for gold foil, the

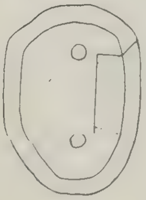

Fig XI.

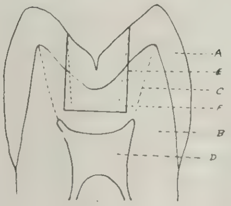

Fig. XII.

Figure XI.

Cross section of bicuspid tooth showing form of the proximal portion of cavity at the level of the gingival wall. The heavy lines in the dentin indicate that cavit yform for gold foil; the dotted lines indicate the cavity form for a gold inlay. Note the amount of dentin which is saved in the latter preparation and its relation to the horns of the pulp.

Figure XII.

Section of a bicuspid tooth cut bucco-lingually in the axial plane. A, enamel cap; B, dentin; C, recessional lines of the pulpal horns; D, pulp; E, indicates cavity as prepared for gold foil; F, indicates cavity as prepared for gold inlay. Note the larger amount of dentin between the recessional lines of the pulpal horns and the bucco-pulpal and linguo-pulpal angles of the cavity when the cavity is prepared with tapered walls as for a gold inlay.

vitality of the pulp is seriously menaced. (Figs. 11 and 12.) In the writer's experience, death of the pulp following the placing of gold inlays is so rare that it may be considered negligible. Some men would attribute this to the non-conductive properties of the cement; but it seems that in many instances this is so small an amount as to be of little consequence. If the use of a cast gold inlay makes possible the conservation of tooth structure in sufficient amount to insure the vitality of the pulp, then the inlay must be considered as one of the very best fillings for the prevention of alveolar abscess.

The value of the gold inlay as a means of restoring lost contour has been much written upon. Many men consider its utility in the restoration of occlusal surfaces its greatest worth. Certainly it is of great value in this respect; but the writer cannot agree with those men who believe that unless every line and wrinkle of the normal occlusal surface is reproduced in the filling, masticatory function is impaired. A proximo-occlusal filling, however, is nothing better than a plug for a carious cavity, unless full proximal contour with strong contact is restored. The fact that the gold inlay offers the easiest and surest and best means of restoring lost contour gives it a position in the first rank as a filling for cavities in those positions where there is danger of injury to the gingivae because of impaction of food. Not only is it a simple matter to restore the contact between two surfaces, but frequently it is possible and practicable to restore several contacts on one side of the arch by a little over-contour of one inlay which may be driven into position subsequent to the movement of the teeth by slow separation.

It not infrequently happens that a patient presents with several fillings in the same region which may have been well done except for the very important matter of contact. (Fig. 13.) Or the lack of contact of one filling may have caused several teeth on one side to move apart just enough to allow food to crowd in through the weakened contact points and press down upon the gingivæ, causing

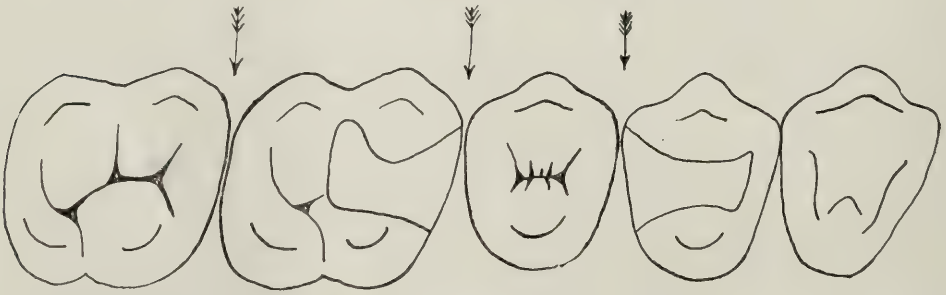

Figure 13

Occlusal view of the upper right cuspid, first and second bicuspids and first and second molars. Arrows point to lack of contact or weak contacts. Fillings in first molar and second bicuspid.

annoyance to the patient and injury to the septal tissue. Such conditions, seriously threatening the health of the peridental membrane, may be greatly improved in many instances by the placing of one inlay. The Perry separator should be adjusted in one or more positions to determine what contacts can be tightened. (Fig. 14.)

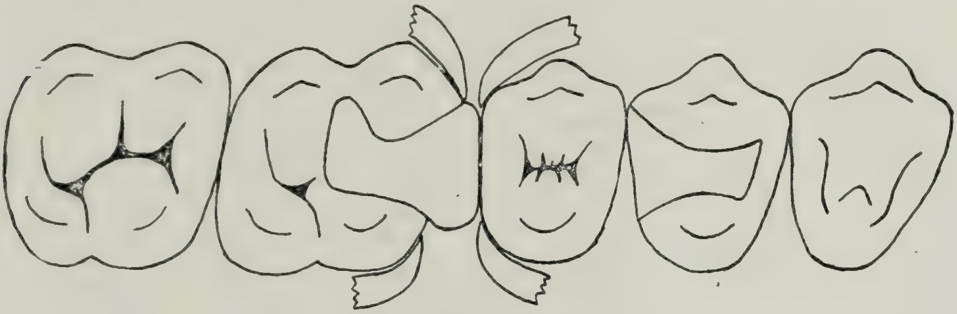

Figure 14

The jaws of the Perry separator are lifting the first molar and second bicuspid apart sufficiently to tighten the contacts between the first and second molars and first and second bicuspids. Gutta percha is shown packed into the first molar cavity after the removal of the old filling.

Usually a filling can be removed and the cavity packed with base plate gutta percha to hold the separation gained with the mechanical separator. If the teeth need to be moved a considerable distance, the patient may return several times, and additional separation may be gained with each sitting. Finally, an inlay may be made which must be over-contoured somewhat and driven into position. This will tighten the contacts and frequently will remedy the cause of the gingivitis. (Fig. 15.)

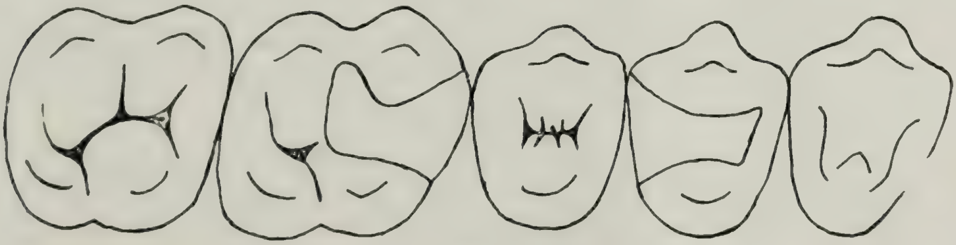

Figure 15

An inlay, somewhat overcontoured, has been placed in the molar cavity. It holds the separation previously gained and restores three faulty contacts to proper tightness.

To be sure, contacts may be tightened in a similar manner with gold foil or amalgam fillings, but the gold inlay seems to lend itself more readily to such operations. Occasionally, when teeth are moved in this manner, it will be necessary to grind one or more cusps a little, so that the contacts in the opposing arch will not be disturbed even by the slight change in conditions.

In the preparation of this paper the writer has tried to direct your thought to the gold inlay and its uses. For this reason it may appear that gold foil has been given a secondary place among filling materials. It has not been the intention of the writer to convey this impression, for it is his firm belief that a gold filling, placed in a suitable cavity by a skilful operator, remains the best filling in use.

Although in using material of this kind, which is the common property of the profession, it is difficult to know from whom one borrows, nevertheless, in this paper, particular indebtedness is due to the late Dr. G. V. Black, Dr. Arthur D. Black, and Dr. R. H. Volland.

The Condensation of Bone

B. R. GARDINER, D.D.S., TORONTO.

THE subject of this paper is one of the most important before the dental profession at the present time. The fact that I am daily removing dead teeth, embedded in condensed bone, brings me in contact with bone tissue of this character more than the general practitioner of Dentistry, and I feel it my duty to the profession to report the result of clinical findings. By recording the results of observations the general practitioner and the Histo-pathologist may understand the difficulties more fully, correct our errors, and supply us with a more scientific explanation of the conditions which we are called upon to deal with clinically.

The condensation of bone may be considered from two standpoints:

1. Age of the patient.
2. Chronic Irritation, being the normal reaction of the bone tissues to injury. These injuries may be, (a) Infection; (b) Traumatic; (c) Chemical.

In a general way we may say that the constitution of bone varies with the age of the individual. This condition has been observed by every practitioner, and it is unnecessary to go into detail and elaborate upon it. Suffice it to say that in the young child, we have a condition of bone a part of which is cartilage. Gradually a deposition of bone salts takes place. In middle life the condition of the bone is still somewhat elastic, and is not as liable to fracture as later in the life of the same individual. In old age the bone is permeated by bone salts. The bone is brittle and friable. If a fracture occurs in the bone of the young, union takes place quickly. In contrast to this, bone tissue regenerates slowly in old people, for with the deposition of bone salts the blood supply is diminished. We may say then, speaking generally, that in the normal individual the deposition of bone salts varies with the age of the patient.

We now come to the abnormal. Deposition of bone salts may follow the usual local reaction of the tissues to chronic irritation. This irritation may be infection, traumatic or chemical. I limit my illustration now to those found in the mouth for it is the condensation of bone around the roots of teeth, with which we are now particularly interested.

Infection at the apex of a tooth is a form of irritation. To offset this condition we have nature's reaction to injury attended by the usual chain of signs and symptoms. The reaction of the tissues to the amount of infection may be such as to produce an acute condition. If the condition is acute, considerable destruction of the bone takes place until a sinus is formed, and the acute condition relieved. The infection, however, may never produce an acute stage. The infection may be produced so slowly or absorbed so rapidly, that there is little destruction of bone. The infection may then be a source of chronic irritation around which we may have a walling off, as in a granuloma, and a condensation of bone.

Traumatic injury, such as traumatic occlusion, may be an example of another form of chronic irritation. Single teeth which have been subjected to heavy stress by having an "over-filled cavity" upon which the bite is heavy, may be supported, and surrounded by condensation of bone. Again, a single tooth, by a form of bridge work, may be called to bear the stress of two normal teeth. Excementosis of the apex of a root and condensation of the bone about it, may be the result. A point I wish to bring out and emphasize is this. The condensation of bone in this instance may be nature's attempt to compromise, and provide support for the overworked parts. This condition may not be infected. Condensation of bone in this instance does not indicate the presence of infection.

Last of all I wish to point out the third cause, that is, condensation of bone salts due to chronic irritation, which may be chemical. This condition I have noticed in removing teeth which I would say had been fairly successfully treated. By this I mean there was no great amount of infection, which would start local irritation, and subsequent reaction, followed by loosening of the teeth. On the contrary, just the opposite condition exists. The peridental membrane is macroscopically absent. The roots and alveolar process are almost ankylosed. There appears to be no movement of the tooth apart from the alveolus. It is indeed a task to remove a multi-rooted tooth from alveolus of this description. There is no spring or elasticity to either process or tooth. It is like removing a glass tooth embedded in concrete. To subject it to force in order to remove it, is merely to fracture it. In these cases the gum tissue should be carefully dissected, the retaining bone removed by a drill, and the tooth merely lifted out.

Apart from the foregoing being just so much, more or less interesting information, one may reasonably ask of what practical value is it to the dentist. In concluding this article let me sum up a few points wherein the above factors should influence our diagnosis of Dental conditions, and even call for a change in our operative technique. To all those who interpret roentgenograms the above considerations should be of very practical value. The usual custom of interpreting roentgenograms is to look for radiolucent areas at the apices of teeth. It is true that infection usually causes a destruction of bone, but sometimes it does not. In still other cases we may have bone destruction, and overlying this a condensation of bone salts. The density of the bone structure *as revealed by the X Ray* may be quite uniform as a result of this combination. Many have suggested that condensation of bone as revealed by the X-Ray is an indication of infection, but as I have pointed out, this is not always true, but may be brought about by malocclusion around a vital tooth. This should be an additional warning for us to put but little faith in roentgenogram interpretations which are not supplemented by clinical evidence.

The condensation of bone is the great factor to contend with in the removal of teeth. The teeth are extremely difficult to remove when exostosed and surrounded by bone of this description. Its presence or absence may influence our choice of an anaesthetic and call for a change in our technique in removing teeth. Perhaps this factor, more than any other, has been responsible for the term "surgical removal of teeth."

Condensation of bone has an influence upon regeneration of the tissues, after the teeth have been removed. Where this condition exists the blood supply is diminished, the possibility of infection is increased and post-operative pain usually follows. We then have what has been commonly called a "dry socket." Patients in this condition should be attended regularly until regeneration has taken place.

Modeling Compound as an Impression Material For the Orthodontist

By James David McCoy, M.S., D.D.S. Los Angeles, Cal.

Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California.

Read before the Seventh Annual Meeting of the Pacific Coast Society of Orthodontists, February 16, 1920.

IN suggesting the use of a material which has for nearly a generation been relegated by the majority of orthodontists to the position of second choice, the writer realizes that his judgment will be questioned and his motives assailed. Such an attitude of mind is usually manifested toward anyone who has the temerity to advocate anything which falls without the pale of that which common usage has established as orthodox.

Plaster of paris has been so generally and so universally used by the orthodontist as an impression material that the mere suggestion by anyone that it might be partially or wholly replaced by another material which would satisfactorily fulfill its function and perhaps have some advantages which might make it preferable to the other, to many will sound thoroughly illogical. Even the writer will not dispute the fact that with plaster of paris perfect impressions can be obtained which will form the basis for the production of accurate and beautiful models. This being the case, the question naturally arises, why should any other material be considered as a substitute?

In considering this question let me first call your attention to the fact that the successful orthodontist of today is handling patients whose average age is far younger than it was a decade ago. For this reason it is important that we employ methods which are adapted to these younger patients, and as the matter of obtaining impressions is usually one of the first acts of treatment it should be robbed, if possible, of any unpleasant features.

That plaster of paris is not a pleasant material to use in the mouth must be admitted by all. If anyone will take the trouble to take double impressions of several children's mouths using plaster of paris for one and modeling compound for the other and then ask the patients which of the two was the least unpleasant, he will find that modeling compound will receive the vast majority of votes. This fact alone is sufficient to make the orthodontist consider carefully the more frequent use of this material providing, of course, it is possible for him to obtain impressions with it which will produce accurate, beautiful casts.

There is still another advantage connected with the use of this material which is worthy of mention, viz., after the impressions are obtained the work of making the cast is attended with less difficulty and a great saving of time. Most busy orthodontists do not attempt to make their own casts, but have them finished by their assistants, and it will be found that the average assistant will handle the cast work better and more expeditiously and with less effort when this material is used in lieu of plaster.

One of the chief causes of prejudice against modeling compound as an impression material (for the orthodontist) is due to the fact that in the past the technique of handling it has been careless and improper, with the result that casts made from it are inaccurate and well deserving of the accusation they have received of being "sloppy."

This material should not be considered as eligible for use unless the operator is willing to use a correct and exact technique. Before outlining a technique the author ventures the opinion that anyone who is willing to carry it out in detail will after a little experience be gratified with the results obtained.

The three most important factors of this technique may be enumerated as follows:

1. The selection of a proper tray.
2. The proper preparation of the modeling compound.
3. Proper handling of the compound while in the act of making the impression.

The ordinary plaster impression tray is quite unsuited to modeling compound. After considerable experience in trying various trays, the writer has finally adopted a tray of his own design. This is an aluminum tray without any handle, with high sides, but with the front cut out. The amount of cut-out must be sufficiently great so that when the tray is placed in the mouth the sides will only extend forward to a point just posterior to the canine eminence. When placed in the mouth, such a tray will bring the modeling compound under pressure in contact with all portions of the dental arch except that portion which corresponds to the cut-out portion of the tray. This portion is ignored as it is obtained separately after the balance of the arch has been secured.

As has been mentioned before, it is necessary to have a generous cut-out in the anterior portion of the tray. The absolute necessity of this will be shown later.

In heating the modeling compound care should be exercised. A water thermometer capable of registering at least 140 degrees Fahrenheit should be utilized. A glass or a porcelain dish capable of holding a quart of water serves as an easy means of immersing the compound. It should be placed in the water with its temperature about 120 degrees. This should be gradually raised either by means of an electric heater or simply by slowly adding hot water until the temperature has been brought up to between 130 and 140 degrees. During the process of its heating the material should be kneaded between the fingers so that it may become uniformly softened. All of this requires but a very few minutes and can be carried out by the assistant. When ready to be placed in tray the operator selects the proper amount for the upper tray, adapts it in and to the tray and after a final immersion in the water places it in position in the mouth.

When the tray with its contents has been brought to its proper position it should be held firmly in place. It may then be chilled by cold blasts of compressed air or by the use of cold water. Regardless of which method is employed it is very important that it becomes well chilled before it is removed from the mouth.

After the preceding steps have been carried out a very accurate impression will be produced of the upper arch, with the exception of the portion lying between—and usually including—the canine teeth.

Upon its removal this inaccurate portion of the impression is cut away to the point where the impression is good, a sharp line of demarkation being made. The impression is then placed back in the mouth and made to occupy its natural position. While being held firmly with one of the fingers of the left hand pressed against the vault of the tray, the lip being lifted for this purpose. This done, the lip is allowed to come down in contact with the material and should be gently pressed against it. This added portion of the impression is then thoroughly chilled and removed separately. This is easily accomplished if the anterior portion of the impression has been properly cut back.

The larger portion of the impression is then removed from the mouth and the two sections fitted together. When their proper relationship has been established, the modeling compound should be fused at several points with a hot instrument so that the union may be permanent.

The same procedure is carried out in taking the impression of the lower arch. This is usually accomplished with less difficulty than is experienced in taking the upper, and for this reason the temptation often arises to take the impression all at one time rather than to resort to the sectional method. This will almost invariably bring about inaccurate results which will be chiefly characterized by distorted impressions of the anterior teeth.

Trays of ample size should always be used for both the upper and lower so that the sides of the impressions will have sufficient body to allow for properly trimmed model bases.

While impressions of the majority of cases may be obtained with the trays so far described, there is always a possibility of cases presenting themselves in which a degree of deformity exists which will require that the impression be taken in more than two sections. Such cases may still be taken in modeling compound by using a Supplee tray and making each impression in five sections, or, if needs be in these rare cases, plaster of paris may be resorted to.

The writer has already mentioned the element of time in using this material. The actual time spent in taking compound impressions using this technique probably exceeds that which is necessary when plaster of paris is used; but, even so, the matter of time is not a serious consideration as this technique may be carried out to the very letter and satisfactory impressions obtained of both the upper and lower arches with the total amount of time spent not exceeding fifteen minutes.

In preparing an impression for pouring, it should first be thoroughly dried out either by compressed air or by allowing it to stand a sufficient length of time, so that all surface dampness is removed, and then it should be given a light coat of very thin sandarac finish. This varnishing is not done with the idea of acting as a separating medium but simply as a means of insuring a better finish to the model surface.

After the varnish has become thoroughly hardened, the model is poured in the usual way, care being taken to avoid the formation of any bubbles.

After the plaster has become crystallized, the impression may be separated from the model. This process should be carried out with due care and accuracy if satisfactory results are to be obtained. The poured impression is immersed in hot water, the temperature of which should be 120 degrees. There should be no guess work in this matter, but an accurate thermometer should be utilized. The water in the dish should then be gradually raised until it has been brought to a temperature of 130 degrees. After the impression has been immersed at this temperature for three minutes the impression material may be readily and easily removed.

It is a great mistake for the assistant to attempt to carry out the separation process without the aid of a thermometer as invariably she is apt to get the water either too hot or too cold, or, what is just as imprudent, to heat it up too rapidly. Where the impression is not properly heated all the way through, teeth will be broken off when it is removed, and, on the other hand, if it is too highly heated it is apt to melt upon the model, resulting in the discoloration of the plaster.

In conclusion the writer recommends modeling compound as an impression material for the orthodontist. First, because it is less objectionable to our little patients than is plaster of paris. Second, because it renders the process of model construction less irksome to the assistant. Third, because if properly handled it can be made to satisfactorily fulfill its function.

The method, undoubtedly, will not appeal to some, but it should not be condemned until it has been given a fair trial, and such a trial entails its use under proper conditions, utilizing a technique in keeping with an exact procedure.

DISCUSSION.

Dr. Arthur W. Sobey, San Francisco—

In beginning our discussion of Dr. McCoy's paper, let us first see what the authorities have to say concerning the matter. By the authorities I mean those orthodontists who have given our specialty sufficient study to be competent to write books for the guidance of the graduate as well as the student.

Dr. E. H. Angle says: "The reliability and value of these models is only in proportion to their accuracy, and the nearest approach to accuracy is in models made from plaster impressions." "It is frequently stated by those writing on this portion of the subject that models sufficiently perfect can be made from impressions taken in modeling compound or other of the plastics. There is no better fact known in dentistry, however, than that an impression of the teeth made with modeling compound or any of the plastics can only remotely approach accuracy, even when they are in normal position. The shape of the jaw, etc., makes the removal of a plastic impression without change of form, impossible." "It is quite probable that those who object to plaster impressions have never taken the time to properly learn the correct method of taking them, otherwise they would find but little, if any, more trouble to themselves or objection from the patient, than if one of the plastics were used."

Dr. V. H. Jackson says: "Impressions of irregular teeth should be made in plaster of paris, at least until one has, through trial, become sufficiently expert to take them accurately with some of the modeling compounds. When the impression is taken in compound, the surface of the model is generally smoother than when taken in plaster; it is quickly made, and the procedure is more agreeable to the patient."

Dr. B. E. Lischer says: "The construction of accurate plaster models * * * is now considered a necessary detail. * * * To obtain this accuracy plaster should invariably be used for the impression from which the model is made."

Dr. Martin Dewey says: "In order that we may obtain the best impression possible—for without a good impression we cannot have a good model—plaster must be used." "Modeling compound has a place in dentistry, but not in orthodontia."

So, of four prominent writers, three are positively opposed to the use of modeling compound, while the fourth favors it to the extent of devoting *two pages* to an accurate explanation of its manipulation and desirability, as opposed to *one paragraph* given over to the use of plaster of paris. But, we must take into consideration the fact that these books were written several years ago—long before Supplee was taken seriously. Are not many prosthodontists today taking their impressions in modeling compound and securing undreamed of accuracy? Yet, most of the textbooks give plaster of paris pre-eminence. Examine the illustrations used in our books on orthodontia. How many of them are of children under ten years of age? When these books were written regulating was rarely attempted until "all the teeth were in place."

It is my opinion that Dr. McCoy has done a big thing for us and for orthodontia by his courage in bringing before us a subject that is sure to receive violent and antagonistic criticism. Rest assured that he would not do so until he had given the subject much thought, and what is of greater importance, a thorough investigation and complete working out of detail in his own practice. To what he says you may pay careful attention and you may feel assured that it is not of mushroom growth, but of careful and painstaking study and work.—The Pacific Dental Gazette.

The Higher and Better Education of the Dental Student*

BY EUGENE S. TALBOT, M.D., CHICAGO, ILLINOIS.

THE object of the formation of this section was to assist in establishing a closer relationship between the mother profession of medicine and the younger specialty of dentistry, and eventually to place the specialty on a medical basis. How much has been accomplished in this direction since its formation, history has shown. Certainly the interest displayed by the ablest men in the medical profession by their presence, in reading and discussing papers, demonstrates that they have done more than their share in placing this section on an equal footing with the other sections in this great Association.

In my early practice of dentistry I soon realized that if I was to become a successful practitioner, I must know more of pathology than I had obtained in the dental school. To obtain that knowledge I must attain a medical education; and although it was a hardship for a man with a family to abandon practice for two years, I have been more than compensated by the broader knowledge and fellowship which I have acquired. Every man starting out in life should have high ideals, and those ideals should be so broad and advanced that it would require a lifetime to accomplish the end.

The ideals firmly fixed in the minds of those men who organized this section were that dentistry, being a part of the healing art, should and must be a part of the medical profession, and that a thorough medical education was just as necessary for treating diseases in the mouth as diseases in any other organ of the body. The dental schools have begun to realize this fact, for since this section was established, the college course has been extended from a two-year to a four-year course, the entire length of a full medical education.

It is rarely the lot of man to live to see his ideals developed to their highest attainments. Nearly all of the organizers of this section have passed on. With one exception, however, they all lived to see great advances along the lines of their ideals.

The stomatologist with his medical education is on an equal footing with the men practising in every other department of the healing art, and is, therefore, freely consulted in the most difficult and obscure etiologic symptoms of disease in which the mouth, jaws and teeth may possibly be a factor.

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*Chairman's address, read June, 1919, before Section on Stomatology, A.M.A., and published in July Dental Summary.

As time goes on and the etiology of disease becomes better understood, the relationship of the general practitioner and the stomatologist must become more intimate. It stands to reason, then, that the man who treats the mouth, jaws and teeth must be a medical specialist, equal to the best medical specialist in other branches of the healing art.

It may be of interest to the members present to know that in the thirty-nine years of its existence this section has not received a single paper on the subject of the mechanics of dentistry. All papers presented and read before the section have been on the subject of pathology or on some subject of interest to both physicians and stomatologists. By adopting this plan, physicians have been as much interested in reading the papers of this as of other sections.

On the other hand, many dentists subscribe for *The Journal* or obtain access to it through physicians in their vicinity. Through this section, therefore, there has developed a closer relationship between medicine and dentistry. The future of this section has a prosperous outlook. Focal infections arising from diseased teeth, and also the associations as a result of the war, have drawn the stomatologist and the medical practitioner into closer relationship. We have arrived at the period when one cannot possibly get on without the other. Physicians are seeking specialists who are qualified to assist them in a proper diagnosis of disease, and naturally associate with those who are medically educated. In the future, therefore, the man who wishes to be a success in his specialty must have a medical training.

The future of the section is assured. Dr. Black comes to us as secretary in the fullness of youth and experience. I am sure that he will direct the future welfare of the section to a higher and broader usefulness.

Wounds of the Face and Jaws.

Modern methods of war and its destruction have developed a line of surgery of the face and jaws that could not have been produced in any other way. Injuries due to explosive shells have caused more extensive wounds than can be produced in any other way. These include fractures, destruction of bone structure, and lacerations of the associate soft parts.

We have with us at this meeting stomatologists who have been most active in the different branches of this service, and who will demonstrate the latest methods of teaching of the treatment of wounds.

Focal Infections.

It has been shown and accurately demonstrated that 95 per cent. of all roots of teeth are imperfectly filled. In other words, owing to irritations in the process of treating and filling the roots of the teeth or to the decomposition of tissue after filling, pathologic changes occur about the roots, as shown by the roentgen-ray and microscope. These pathologic changes have been known to the profession for the past eight or ten years, and yet the same methods of treatment are applied to-day as formerly. How long would the medical profession continue to perform an operation on any other tissue of the body, knowing that the technic was so faulty? My researches on animals during the past twelve years[†] show that the least irritation produced in the treatment of the roots of the teeth will cause absorption of the alveolar process and roots, with irritation and inflammation of the peridental membrane.

Abnormal collateral arterial development in the roots of the teeth and the abnormal development of the granular layer of Tomes—researches of which have not yet been published—demonstrate the almost complete hopelessness of permanent success, no matter how well the root may have been filled.

The number of focal infections and disturbances from faulty root fillings, local and systemic, is appalling. The average dentist, not being grounded in pathology, does not and cannot appreciate the seriousness of his faulty treatment. A different method of root filling must be immediately instituted, or devitalized teeth must be extracted A rule which I have adopted is that a patient's health is worth more than all the natural teeth.

FAULTY METHODS OF PRACTICE.

From time to time, in the past thirty years, I have repeatedly called the attention of the profession to the fact that modern dentistry is producing more disease than any other one cause. The profession is beginning to realize the truth of this statement. Since the first dental college was established, there gradually has developed a method of practice of mechanics regardless of pathologic results. The method of practice, at best, has benefited the individual patient only for the time being. On the other hand, after operations are performed, disease has followed in almost every instance.

Our present method of treatment has not benefited the race as a whole. Decay of the teeth and deformities of the jaws have increased from generation to generation until at the present time hardly a child under twelve years of age can be found free from tooth decay and deformities of the teeth and the jaws. Since our present methods of procedure are faulty, we must resort to radical changes in treatment and devote our entire attention to preventive measures.

MEDICAL TEACHING VERSUS DENTAL TEACHING.

The wonderful progress made in medical teaching in the last fifteen years should be an incentive for the better education of the dentist. In 1904, there were about one hundred and fifty-six medical schools in this country. Through the influence of the Council on Medical Education the standard has been raised, and the number of schools, by combining one with another or by dropping some out altogether, has been reduced in the last fifteen years to eighty-five. From 80 to 95 per cent. of these schools now require for admission two years of work in a college of arts and sciences, as compared with only 2.5 per cent. of all colleges holding that requirement in 1904. In some of the schools there has been a continuous session of the four quarters plan, whereby the student is allowed to select any three quarters of the year that best suit his convenience to complete his yearly term.

[†] Talbot, E. S.: Dental Cosmos, May 1919.

The chairman, Dr. John M. Dodson,[¶] in his report asked: "Is there a logical reason why the student should not be allowed to utilize the summer months in full-time medical work in residence, and thus complete the present requirement of four sessions in three calendar years, his year of internship in a fourth year, and so enter into active practice a year earlier than has been possible under previous regulations?"

Under the four quarters scheme, seven weeks may be provided for vacations, so that attendance on the four quarters is no hardship for the student in good health who desires to avail himself of the privilege.

Dr. N. P. Colwell,[§] in stating the further needs in medical education, said that an improvement still greatly needed in medical schools concerns the methods of clinical instruction of medical students. Students should be enabled to complete most of their didactic courses in the third year, so that most, if not all, of the time of the fourth year may be devoted to clinical courses for groups of about six students each in the hospital wards.

These changes, so necessary in medical schools, are just as necessary in the dental schools. I have advocated these changes in dental teaching for a number of years. Why should a student spend four years in college when he can save a year far easier than the medical student, since only half of his curriculum is given up to didactic teaching, and the other half to the mechanics of dentistry? The mechanics of dentistry can very easily be taught in the summer months, and the fundamental principles of medicine and dentistry may be left for the winter months. The curriculum can be so arranged that the student can have from five to seven weeks' vacation, which is from three to five weeks longer than the vacation of the average professional man.

I have held for many years that the dental school could not make a professional man out of the student by the present method of teaching, even if the course should be extended to six or eight years. There are two grades of dental colleges in the United States: those that are an actual part of universities or colleges, and those that are not. Those that are a part of universities have nothing to do with the matriculation of students. Those that are not, have everything to do with the entrance requirements of students. There is an unwritten law among the dental schools that all students entering must be either graduates of a high school or they must successfully pass an examination covering the average high school requirements. The result is that a large percentage of the students entering the dental schools other than those connected with universities or colleges have not an education equal to that of our common schools. It is possible that the dean can explain how these students enter.

[¶] Dodson, J. M.: Problems in Medical Education, J. A. M. A. 72: (March 15), 1919.

[§] Colwell, N. P.: Recent Progress and Further Needs in Medical Education, J. A. M. A. 72: 822 (March 15), 1919.

Having entered, the uneducated student immediately begins to ascertain what is necessary for graduation. He soon learns that the mechanics of dentistry is the essential thing, since he cannot graduate until he can successful perform certain operations on the teeth and make artificial dentures. Most of his thought and time is spent along these lines. Courses are pursued in the departments of anatomy, physiology, pathology, bacteriology, chemistry, etc., but are not considered of so much importance, as it is the mechanics of dentistry that counts toward graduation and practice.

The student begins his mechanical training almost as soon as he enters school. The result is that the ignorant young man, following the line of mechanics, on graduation enters practice as a mechanic rather than as a professional man. As I have already stated, by this method of teaching, a six-year or eight-year course would not improve the mentality or standing of the individual in the community.

Again, students entering the dental school from the farm, shop and factory are unmindful of what is required of them when they enter practice. They pay their fee and expect to be qualified to serve the public successfully when they enter practice. They soon learn, however, that a broader knowledge of the essentials of medicine is necessary to cope successfully with the conditions presented by their patients than they had received in their dental training.

The remedy is easy. Make a professional man out of the dentist, as well as a mechanic. Require the student to take one or two years' work in the arts and sciences. This will relieve the dean of the dental school of all responsibility of the preliminary requirements. The first two years of work in the dental school should be given up to didactic teaching. The student should not be permitted to operate on patients or perform mechanical laboratory work until the third year. All or nearly all of the last two years may be given up to the practical side of the specialty. The preliminary training in the laboratory of the academic and pre-medical courses will give the student all the finger training that is necessary to prepare him for his dental activities.

BOOK READERS.

There are about 45,000 dentists in the United States. Out of that number not over 500 buy books relating to their specialty, or read them. The reason for this already has been explained. Dentistry is a part of the healing art. There is no reason why the dentist should not be as well educated as the physician and hold an equal position in the community. It is high time that the profession itself awoke to the situation and demanded better qualified graduates from our dental schools.

UNIVERSITY SCHOOLS.

This section has always used its influence on the side of the university schools. Your secretary has made it a point to attend the annual meetings of the Dental Faculties Association of American Universities when possible, and has always been received with much cordiality. He has read and discussed papers relating to the higher and better education of the dentist. I would suggest that the executive committee of this section be made a standing committee to attend the annual meetings when possible and use its influence on behalf of this section, to suggest improvements in special teaching, and to encourage the teachers in their efforts to place their schools on an equal footing with other departments of the healing art.

31 N. State St.

DISCUSSION.

Dr. E. A. Bogue, New York: There is in the dental profession an idea of lack of recognition by medical men that is pretty general. As soon as our men are prepared the medical profession is prompt to recognize. If it were in the power of this section to encourage the younger men to go through the medical school it would be desirable. I knew pretty intimately Sir John Tomes and J. Smith Turner, who are responsible for the dental law of England; yet, with all the care which was given by them and their friends, the unqualified practitioner in number surpasses the other practitioners in England to-day. There are many in England to come up to the level which has been formed by our well-qualified men during the war.

Dr. Frederick B. Moorehead, Chicago: One does not need to look far to discover the trouble in dental education. The whole fault lies in the organization of a separate training for dentists. The dentist should receive, in a large measure, the same training as the physician, and dentistry will never be a satisfactory component of medicine until the dentist and physician are on an educational parity. To bring about the necessary change in dental education, it will require several years and must be done by evolutionary rather than devolutionary methods. We face a condition, and not a theory, in the premises. The people must be cared for in the matter of dentistry, and with the increasing knowledge on the part of the layman of the dangers of mouth infections, there is going to be a corresponding increased demand for dental services. To meet this demand more dentists will be needed. It will seem, therefore, that the first responsibility in dental education is not to decrease the output of dentists, but strengthen the dental curriculum to a point which will bring about a change of character in the dental students. We have at present a four-year curriculum with a high school graduation for admission, and in 1921 the better dental colleges of the country will require one year of college for admission to the dental curriculum. This will necessarily decrease the output of dentists somewhat, and the requirement of one year of college for admission will probably have to stand for a number of years at least before any additional steps can be taken with safety. As soon, therefore, as the supply or demand will warrant, two years of college should be required for admission to the dental curriculum, which will place the dental student and the medical student on a basis of equality. When this step has been reached the first two years in dentistry and medicine may be identical. At the end of this period the dental student may undertake special training, and the medical student may also select his own special field of practice. A degree in medicine should then be conferred on both groups. We have before us an exceedingly difficult task, which must be faced with considerable thought and care. The supply must not be reduced seriously, and at the same time the training of the dentist must be of a different character if he is to functionate as an intelligent part of the medical program. It may be true that the question is too large for any early solution, and that we shall have to arrange for the special training of persons who will practise dentistry from a medical standpoint purely, and continue to train students for the general practice of dentistry as in the past.

Dr. W. C. Fisher, New York: We speak of requiring a one year course in college. The Council on Medical Education, in their report, emphasize one great point: That there was one year of the four years in the high school that could be saved; and it was the consensus of opinion of many of the faculties that the first year in college is almost a wasted year. If you are going to ask one year college education as a requisite of entrance to the dental college, you are asking a man to spend a year almost wastefully because that first year in college is a year of finding oneself. The Council on Medical Education thought that they must stop adding years to the time when a man may take his degree; that the limit has not only been reached, but it has really been passed; that they must now endeavor to go back to the preliminary education, and cut off years from that. This differs distinctly from Dr. Moorehead. If the young man is capable of going to college from high school, he is capable of going to medical or dental college. The medical faculty could exercise over these students the same care in their dental and medical colleges that they obtain in the schools of letters.

Dr. Arthur D. Black, Chicago: I think that no matter from what angle we discuss this question, we must eventually come back to the ground on which Dr. Talbot has stood for all these years, and that is that the education of the dentist must be practically the same in its foundation work as that of the physician. I believe there is no question in the minds of most men who are interested in medical education, but that it would be thoroughly practical to cut out a year somewhere in the high school, or possibly in the grade school, and thereby bring a man up to entrance to the medical school a year earlier. In proposing to do so, we can not overlook the fact that a comparatively small percentage of high school graduates enter college, so that our problem is a side issue with those who are in charge of the elementary schools. I only mention that to emphasize the complexity of the problem that we have before us. In the management of our public schools, educators seem to be gradually coming to the realization that a year cut off for everybody would be to their advantage, and eventually this may be brought about.

I would like to emphasize what Dr. Moorehead has said of the necessity of this being an evolutionary matter, and to impress the fact that it will take a good many years to accomplish our present objective. Suppose, for example, that the dental schools require one year of college for entrance in 1921, and that possibly in 1925 they require two years of college, that means it will be 1929 before we have our first graduates of a dental school on a parity with the graduates of the medical school of to-day. It seems like a long time in advance, and yet that is the very earliest time within which the change can be made. Nevertheless, if we look backward for a period of ten, fifteen or twenty-five years, I think we can not help but realize that we have been making progress in all these years, and we are going to continue.

Dr. Charles R. Turner, Philadelphia: I feel that dental education has a present plotted out for itself, the same program that it has ever plotted out for itself. Dental prestige in America came, of course, originally from the development of the mechanical or the manipulative side. It was that, of course, which brought it to the attention of the practitioners of this profession in other parts of the world; in fact, for many years that was "American dentistry." That is all there is to it; and that very thing has been our undoing. We have hitched our wagon to that thing for too long a time, so that, as we all know perfectly well, we are now beginning to realize that it has blinded us to a proper appreciation of the vital relationships of these things. Now we have within the last few years been paying particular attention to trying to correct that thing, but attaching greater significance to what may be called the vital relationship of dental operations; and it has been along that line that dental education has been working in the last few years. We must remember that the dentist must not only have knowledge, but he must have skill. It is wise for us to bear that phase of the matter in mind, and I must confess that I am disposed to feel that the training of the fingers should start as early as possible.

Dr. Eugene S. Talbot, Chicago: I brought out in my paper the vital points that we have got to consider immediately, the points that I have stated in the paper have been known from a pathologic point of view for a great many years, and I have occasionally, from time to time, called the attention of the profession to those vital things in pathology, the statement I made more than thirty years ago, that dentistry was producing more pathology than any one cause is beginning now to be recognized. The vital points in this paper have got to be considered right away, for the reason that we are producing more pathology than the patient; that is to say, nearly every operation that is performed in the mouth produces and leaves later in the mouth a pathologic condition. We have got to immediately change our methods of teaching. The whole thing lies in the dental school. We have got to teach pathology, and make mechanics a second consideration.

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Why We Insist on Early Orthodontia Treatment*

By T. G. Duckworth, D.D.S., San Antonio, Texas.

THE question of early treatment has been so well impressed upon my mind in an effort to secure and maintain the best possible results for the patient that I unhesitatingly confess that we are not making an endeavor, as probably we should, to educate the public to the urgent necessity of attending to irregular teeth and malformed arches early enough in a child's life.

The great majority of children that undergo orthodontic treatment, I believe you will agree, have erupted the majority of the permanent teeth. This being the case, the necessity of retention must be longer and more uncertain than if these children were treated when they retained the temporary teeth. Cases that do not show a tendency toward malformation until after the eruption of the permanent teeth can not be considered before, but most all cases show some evidence of abnormal development long before it is generally deemed advisable to subject the child to orthodontic treatment.

In going over the literature published on this subject a great deal is said in reference to Dento-Facial deformities, how to correct them, and the appliances employed to accomplish the end result.

This is essential as we can not select the patients and they must be treated regardless of the age, provided the work is beneficial to them.

However, it is quite noticeable how few cases are treated, at least illustrated in articles which are published showing any evidence of prevention. The young child less than seven or even five or six years of age can be handled with more ease, and decidedly better results can be gained with fewer appointments, and with less inconvenience due to a long and tedious retention.

Every mother should be impressed with the necessity of reporting to the orthodontist at intervals, beginning with the eruption of the first temporary tooth and until such time as the child is assured of a perfectly formed arch with the teeth in correct position.

In my practice it is a pleasure to work for a number of children three, four and five years of age. The cooperation is these cases is the best and the retention is permanent.

Even though something prevents the proper eruption of the succeeding teeth, time has been saved and in the end the result is more satisfactory. I believe it is possible to fulfill the demand of science in orthodontic procedure, but this necessitates a close study and a more intimate knowledge of the habits of bone growth and of the tissues we are to operate upon, for let us remember that we can do nothing of permanent value by ourselves in our efforts at treatment, but only as we work in conjunction with Nature, studying her carefully, interpreting her wishes and intelligently assisting in her efforts of growth and development. Fortunately we have some wonderful chapters on histology and embryology, and a study of these must convince us of the most active period of development. The beginning and ending of calcification of the osseous tissue should be a guide in assisting Nature to build the parts in harmony and according to normal influences. If we are going to allow abnormal influences to intervene at three years of age and then correct them at twelve, our motives must be other than the importance of a full complement of teeth well arranged, and the very important part that each tooth plays in its relation to all the other teeth of the denture, that the denture may not only be in function most efficient, but that it may contribute its full part to the normal beauty and balance of the face according to the individual type, and also its normal part in the possibility of normal growth and development of the throat and nose, all of which are so essential to the health and growth of the individual. To recognize and combat abnormal influences in their early stages, means a great deal toward prevention, and while in itself not complete, will aid materially in treatments and shortens the period of retention.

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*Read before the Alumni Society of the Dewey School of Orthodontia, April 1920.

We have many types of children to deal with and in varying stages of development, and our chances are great in studying the details which bring about the most satisfactory results. It also enables us to see the advantages and disadvantages of certain forms of appliances used when treating young children and the ones employed in older children, as, I believe you will all agree that very delicate appliances in the form of a lingual bar are sufficient in these young cases and in many instances adjusted only to the lower teeth. There are exceptional cases, however, which demand considerable root movement, even though in children quite young, and our appliances should be such as will best fulfill these demands. Anxious parents are extremely grateful for any assurance of a successful and permanent result, and it is only in the very young children that we can rely upon the result as being permanent without a great deal of discomfort to the patient in wearing retaining appliances over an indefinite period.

Cleanliness of the mouth must be observed during the treatment, and if the appliances are adjusted to temporary teeth as much as possible, we can avoid injury to the permanent teeth which will occur at least to a limited, if not to a very great, extent. The actual movement of teeth apparently seems to be accomplished in the older patients almost as readily as in younger children, but the retention in the older children of twelve to fourteen are never positive in my experience. I do not mean that the arches collapse entirely or that the teeth go back to their original position, but there is invariably some crowding of the anterior portion of the arch with one or two teeth slightly overlapping on the lingual or buccal inclination of some tooth. This condition of affairs spoils the effect of one's efforts toward an ideal result and lessens our hope of ever obtaining what is ultimately desired in these cases.

I was very much interested in an article read before the American Society of Orthodontists last year by Dr. Rogers on "Muscle Training and Its Relation to Orthodontia." In this paper he has to say, "It avails us little if we diligently seek to place one part of the human machine in harmonious relation and neglect that other part upon which permanent success depends."

A number of cases, no doubt, have failed in our hands even after prolonged retention, due to some inability on our part to recognize and correct abnormal influences which continue to act after the retainers are removed. It is often surprising, the cooperation received with these very young children and the instructions to these patients are more religiously carried out. The mothers assume the responsibility for seeing that the child keeps all the appointments and at this early age other allurements have not the attraction to keep the patient from the office, that they have at a later period in life. If the child is supplied with new and correct guiding impulses he is more apt to acquire an ability to combat abnormal influences, bringing about coordination of muscle groups and a complete control of their muscular mechanism. This must in time have a beneficial effect upon the parts we are directly concerned in and our teaching has accomplished what later would have been done by mechanical interference, with a useless waste of time and treasure. From the beginning ,an individual is constantly surrounded by influences and environmental conditions that ultimately establish the character and development of the parts, and unless every precaution is observed against interference to health and harmony of functional adjustments, disease and disharmony will reign.

Every evidence of interference should be discouraged at its incipiency so as not to allow the parts to lose their normal activity in the slightest degree. The solution of our difficulties should, and I believe will, soon be largely one of prevention; at least, we will be able to so govern the patients that they can be brought to realize the responsibility of their own destinies, to an extent of reporting to the orthodontist early enough, so that preventive measures may be adapted and the slight maldevelopment corrected. This would insure the parents of the necessity of looking after and caring for the temporary teeth, and the importance of their proper retention and loss, and the influence they bear in reference to the permanent set.

The tonsils and respiratory passages should be thoroughly examined for the detection of any probable interference from these sources, in fact, each of those forces which tend to produce inharmony of the parts should be eliminated and the attention of the parents called to their probable correction. We should lend to Nature a little assistance during her early developing period, at a time when the balance between normal and abnormal is nearly equal and the influences of an abnormal nature are fast making themselves apparent. The natural forces, such as cell metabolism, forces of the inclined planes, normal approximal contacts, harmony of shape, and sizes of the dental arches, atmospheric pressure, muscular pressure and such interferences as may be grouped under the heading of mental, respiratory, and postural may be encouraged to assume their natural attitude toward building the dental apparatus along natural lines and in keeping with the individual type. Greater efficiency in development and greater rewards from the standpoint of health must be the result of this early attention. The chances are just as great and as necessary or even more so in teaching children how to prevent abnormal influences as it is to teach them to overcome certain influences and even though the opportunity has not presented itself for such instructions until after some mechanical correction is found necessary, it will at least prevent further deflections in proportion to the degree of thoroughness in which the instructions have been given, and the sincerity in which they are received and carried out.

Experimenting with appliances for accomplishing the necessary tooth movement in these early cases is much more simplified and the gentle pressure necessary in assisting Nature by stimulating cellular activity can be neatly and physiologically applied in such a way as not to interfere with normal muscular activity, which must be recognized as a great factor in maintaining permanent results.

The displacement of the soft tissues during prolonged treatments has invariably resulted from the appliances that were used and they have exaggerated, if not actually produced influences, which did not exist at the beginning of the treatment and it is only through well directed efforts that these influences are ever overcome. Dr. E. A. Bogue has written and experimented a great deal along the line of early treatments and sets forth his conclusions in a paper which was published in the *Journal of the American Medical Association*, August 9, 1902, explaining that, "These operations would be almost or quite painless, that they may be accomplished with great rapidity if necessary, and with such certainty that absence through unexpected sickness or protracted journeyings need not interrupt the orderly progress of work, provided sufficient notice be given to the operator, that the work may be accomplished with no perceptible detriment to the teeth." He reviews a number of very interesting experiments in an article, "Orthodontia of Deciduous Teeth," published in the *Dental Digest*, April, 1919, and says in part, "Another reason why orthodontia of the deciduous teeth should be practiced in civilized communities was brought very forcibly to my attention at the Hygienic Exposition in Dresden a few years ago, when I found that the average weight of the brain of the child at birth is 371 grams, at six years of age its average weight being 1,360 grams, and at nineteen years of age 1,400. A gain of 989 grams in the first six years, only 40 grams in the last twelve." The masticatory apparatus is a living part of a living thing and is subject to the same general laws as are other parts of the organism and from these weights and other evidence at hand the most active period of development is during the first six years of a child's life. "The causes of malocclusion, to be intelligently comprehended, must be studied from the basis of the normal growth of the denture and its correlated parts. Most of the immediate causes are mechanical, yet whatever acts as a hindrance to nature in performing her delicate offices in the unfolding of the various tissues composing the dental apparatus during its growth will be operative as a cause in producing malocclusion."—*Angle*, 7th ed. 1907, p. 89.

Dr. Milo Hellman has written some splendid articles in reference to early treatments, one in particular which is beautifully illustrated showing at what an early age the tendency toward malformation can be detected and how readily influences of an abnormal nature make themselves evident and also the pernicious effects of these influences upon the developing masticatory apparatus.—The International Journal of Orthodontia and Oral Surgery.

SENSITIVE DENTIN.—Two parts oil of cloves, with one part carbolic acid, sealed up in a sensitive cavity for several days, possesses great value.—(*E.S.*)

APPLICATION OF RUBBER-DAM CLAMP.—If when applying the dam clamp, you fold two little pieces of muslin and lay them between the clamp and cheek, your patient will appreciate it.—(*F.M.S.*)

FEEDING.—The question of feeding is a very important one to the child. I do not know how many have read of what Mrs. Mellanby has done. It certainly is exceedingly interesting and valuable, and a great deal may result from it. In modern times particularly, we have put too much stress upon the importance of cooked food rather than fresh food, in the way of green stuff and particularly fruit. A good deal of cooking must destroy some of our valuable food.—*Joseph A. Wood, Dental Record.*

MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

NITRATE OF SILVER ANTIDOTE.—The use of a solution of sodium chloride after the application of silver nitrate to any of the mucous membranes will do away with the great discomfort to the patient resulting from the application of this drug.—(*W.G.*)

DANGER OF THE MUCOUS PATCH.—Fournier has made a summary of the dangers of the mucous patch, which I quote in full from MacKee's American Edition, p. 499:

DANGERS OF THE MUCOUS PATCH.—We may say approximately that out of ten syphilitic contaminations one is derived from the chancre against nine from the mucous patch. And how can it be otherwise?

1. The chancre has only a limited existence of a few weeks.

2. The chancre occurs only once in the whole course of the disease and is not reproductive.

3. The chancre with its induration, ulceration, and satellite bubo, is more observable than the mucous patch, and consequently more attention is paid to it.

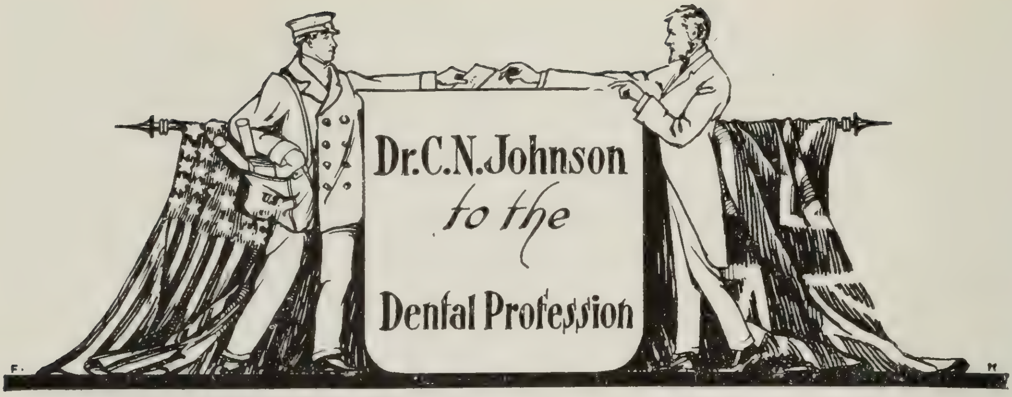
While on the other hand:

1. The mucous patch is essentially liable to recurrence, even ten or twenty times.

2. The mucous patch is a lesion with multiple localizations, which may affect the mouth more often than the genitals, but many people believe that syphilis, as a venereal disease, is confined to the genital organs.

3. The mucous patch is a lesion which may occur several years after infection, even ten years after the chancre, at a time when the disease is believed to have ceased to be infectious.

4. Lastly, the mucous patch is especially dangerous by the excessive benignity which it often assumes, when it consists simply of a simple erosion. Many patients, deceived by such appearances expose themselves to transmit contagion.—*Herman Goodman, Cosmos.*



Consideration for Others

WHEN I am in the washroom of a Pullman sleeper I can usually tell the men who are gentlemen and those who are not. There is something which stamps the real gentleman at once when he comes in contact with his fellowmen, and it is not so much elegance of diction, taste or richness of dress, exclusiveness of manner, or any of those attributes which are accounted paramount in the make-up of a gentleman—it is not so much these as it is that innate consideration for the rights and privileges of others which is the real foundation of all ethical relationship one with the other.

And in no place is this more conspicuously shown than among fellow-passengers in a sleeping car. They are thrown so closely together in the limited space of a washroom that the amenities of life are more intimate and pronounced than elsewhere. And a real gentleman recognizes this and acts accordingly. He may, or may not, say a word to his fellow-passengers, but he goes unobtrusively about the affairs of his toilet without causing unnecessary inconvenience to others in the washroom. He does not spread his articles of apparel over the room and take up space out of all proportion to his rights. He shows some consideration for those about him.

And there is one little act above all others which seems to me most significant as stamping a man a gentleman or otherwise. It is this: After washing and splashing up the bowl, if he takes a towel and wipes it clean and dry for the next passenger he is at once raised in my estimation. Think of it! What right have you or I to make our fellow-passengers clean up after us? And this is precisely what many travellers are doing every day—some of them unconsciously being rude and imposing on others, while some are indifferent to the amenities, and care not a whit how much they inconvenience their fellowmen. If their injustice were ever called to their attention they would at once claim that it is the duty of the porter to clean up after the passengers, and some would arrogantly inform you that they were not travelling for the purpose of doing a porter's work. All of which is wrong—wrong in principle and wrong in practical application. In the first place, the porter could not well wipe the bowl after every passenger, and in the next place he is usually out in the car, very properly making up the berths. And anyhow, what right have you or I to go through the world having people wait on us hand and foot at every turn? By what circumstance of birth or position was it ordained that we should lord it over our fellowmen, and loll back helplessly all the while waiting to be served?

I am not foolish enough to affirm all men can go through the world on a perfect equality. Some have the mental and physical endowment for one kind of service, and some for another. There are men and women who lack the mental initiative to direct the affairs of the world, or to direct affairs of any kind. Someone must go ahead and lead them. They are fitted to do only what they are told to do, and their physical endowment is usually very much superior to their mentality. The fact that they must do the physical labor rather than the mental is apparent to everyone; in other words, they are fitted for servants and for nothing else. Happy is the man who realizes his peculiar fitness for certain things, and who goes cheerfully to his allotted task and does it as well as he knows how.

But this does not give to others who are better endowed mentally the right to brutally lord it over the underling and impose on him such menial tasks, or in such lordly fashion, as to stunt his mentality still farther, and force him lower in the scale of self-respect. We should constantly aim to build up character and respect rather than to tear it down.

The lack of consideration which some people show for their fellowman is a disgrace to our civilization. It matters not that one individual may have more money than another—it matters not in the least. So many times has it been stated, and so often has it been demonstrated, that the possession of money does not make a gentleman of a man.

I liked very much the contention of the late Count Tolstoi, who claimed years ago that every boy and girl, no matter what their station in life, should be brought up to wait on themselves. That is, if they took a bath they should clean the tub after them and not leave it for someone else to do; if they misplaced any article, it should be put back in its proper place—in other words, that they should hold themselves responsible for correcting any disorder which they might create in their daily duties. How much better this than to bring up a child to the theory that he is superior to others, and that it is his inalienable right to be waited upon.

I recall a boy from a supposedly fine family who got out of my chair one day and threw the napkin carelessly on the floor—for someone to pick up. I was sorry for that boy; I knew he had a lesson to learn. And he got the lesson. He was draft age when the great war broke out, was taken to France and served in the ambulance division for many weary, nerve-racking months. When he came home he was a changed boy, a lovable boy. Now he is most solicitous for others, most considerate of their point of view, most charming as an individual. He learned his lesson, and is much happier in every way than before. The war was not all in vain.

Every child should be trained to a sense of his individual responsibility. It should be forced upon him that when he constantly does things which add to the burden and impose hardship upon others he is committing a deadly sin, which will react upon him in a myriad ways. A wrong point of view is a calamity to any individual, and the worst of all points of view is the one which instills into any man's mind the theory that he can go through life without consideration for his fellowmen.

C. N. Johnson

Curetage

NEXT to prevention, curetage is probably the most important word in the vocabulary of modern Dentistry. Whether it be removal of debris in caries, scaling pyorrhea pockets, or instrumentation following extraction of infected roots, thorough curetment is absolutely essential to the ultimate success of the operation.

Toronto Dental Society 1920-21

OPENING MEETING IN SEPTEMBER

DR. Gysi, of Zurich, Switzerland, who is on an extended tour of the United States, will lecture in the evening, about September 15th, at the Dental College, Toronto, under the auspices of The Toronto Dental Society. His subject will be "Some Essentials to Masticating Efficiency in Artificial Dentures." This will be the only appearance of Dr. Gysi in Canada, and out of town Dentists will be welcome at this meeting. Watch for definite notice later.

W. H. Coon, President; H. H. Armstrong, Secretary.

ORAL HEALTH

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Vol. X. TORONTO, AUGUST, 1920 No. 8

EDITORIAL

Canadian and National Dental Associations

THE National Dental Association will hold its Annual Meeting in the city of Boston, from August 23rd to 27th, 1920. During that week a number of allied societies will also meet, notably, The American Academy of Periodontology, The American Dental Library and Museum Association, The National Association of Dental examiners, and The Supreme Chapter of the Delta Sigma Delta Fraternity.

One week previous to the National Meeting, the Canadian Dental Association will hold its Tenth Biennial Convention in the City of Ottawa, August 17th, 18th, 19th and 20th, 1920. The proximity of dates of these Societies offers a splendid opportunity for American and Canadian Dental confreres to enjoy the broadening influence of professional confraternity. Members of the National Dental Association are cordially invited to the Ottawa Meeting, and Canadians in turn will find a warm welcome awaiting them at the Meeting of the National Dental Association in Boston.

The writer invited Dr. Burton Lee Thorpe, of St. Louis, to state what in his opinion had been the greatest achievements of the National Dental Association since its reorganization, and we cannot do better than quote his reply in part:

"The greatest achievements of the N. D. A. have been the perfecting of the present plans of the Research Institute at Cleveland, and the establishment of *The Journal*. In 1913 *The Journal* was originally suggested by our efficient Secretary, Dr. Otto U. King, and was subsequently published as a Quarterly. Since 1916 *The Journal* has been published on a monthly basis. It now has the largest paid circulation of any Dental magazine in the world. Its advertising pages are evidently most attractive, as it enjoys the highest advertising rates of any Dental journal.

"To the writer's knowledge, the reorganization of the N. D. A. was agitated as far back as twenty-five years, by such men as the late Dr. J. Y. Crawford and the late Dr. B. Holly Smith. A few earnest men, through continued effort and unconquerable will, succeeded in bringing the N. D. A. *Journal* to the success it is to-day. Among those most prominently connected with this movement were H. J. Burkhart, R. Ottolengui, J. D. Patterson, Homer C. Brown, Otto U. King, and Frank O. Hetrick.

"No one man 'turned the trick,' as one frequently hears, but the unanimous effort of a few who kept 'everlastingly-at-it" won success, primarily brought about by the pioneers 'who dreamed dreams and saw visions' years ago."

The 1920 National Meeting promises to be the most successful Convention in the history of American Dentistry, and Canadian Dentists are urged not only to attend their own Convention in Ottawa, but also to plan to spend the following week at the National Meeting in Boston.

The Canadian Dental Research Foundation, the Canadian Dental Faculties Association and the Dominion Dental Council will all meet in Ottawa during the Canadian Convention. The C. D. A. programme is of special interest and representative groups of Dentists will be present from every province of the Dominion.

Opium and Narcotic Drug Act

UNDER the amendment to the Opium and Narcotic Drug Act, which was passed at the recent session of the Dominion Parliament, it is provided that the same shall come into force on a date to be fixed by proclamation of the Governor-in-Council. It is the intention of the Department to have this Act proclaimed and come into force on or about September 1st, 1920.

Under the new Act, all wholesale druggists, manufacturers or dealers are required to obtain a license to deal in these drugs, for which an annual fee of Twenty-five ($25) Dollars is charged. All retail druggists who manufacture narcotic drugs, or preparations containing the same, are required to obtain a license, for which an annual fee of Five ($5) Dollars is charged. All druggists, other than those who manufacture, and every physician, veterinary surgeon and dentist is required to make a declaration that they are engaged in the sale or distribution of these drugs. Forms will be supplied by the Department on application to be filled in and returned as required under the Act.

The Act also requires all druggists, whether wholesale or retail, and all manufacturers, to keep a record of their receipts, together with a record of the quantity manufactured, and a record of their sales. These records are required to be kept in a special book kept for this purposes, and after a prescribed form.

Another important change under the new Act is the limiting of the number of ports in Canada at which these drugs may be imported or exported, and the provisions whereby opium and other drugs intended for export must be packed and marked in such a manner as to denote the contents of the packages.

Provision is made under the Act for the sale of preparations intended for internal use which do not contain more than two grains of Opium, or more than one-fourth of a grain of Morphine, or more than one-eighth of a grain of Heroin, or more than one grain of Codeine to the fluid ounce. Provided, however, that such preparations must be medicated to sufficiently preclude the possibility of their being purchased simply to obtain the narcotic effect, and further, that such preparations must have printed on the label or wrapper in a conspicuous place the following warning: "*IT IS UNLAWFUL TO ADMINISTER THIS PREPARATION TO A CHILD UNDER TWO YEARS OF AGE, AS IT CONTAINS OPIUM AND IS DANGEROUS TO LIFE.*"

The maximum penalty for infraction of the Act has been increased from Five Hundred Dollars to One Thousand Dollars, and a minimum penalty of Two Hundred Dollars is provided.

A Great Project

A PROPOSAL of great moment to dentistry was recently announced, at a dinner held on the evening of June 12th at the Genesee Valley Club, in the city of Rochester, New York. A gift of $5,000,000 to the University of Rochester by the General Educational Board which is the John D. Rockefeller federally incorporated board, and a gift to the same institution by Mr. George Eastman will be combined and devoted to the establishment of a medical and dental school in connection with the University of Rochester. The Rochester Dental Dispensary, which represents a gift of $1,500,000 by Mr. Eastman, will be continued for the treatment of children and adults, and its co-operation has been enlisted for the organization of what promises to be one of the leading educational institutions in the world. The General Educational Board, through its distinguished secretary, Dr. Abraham Flexner, and collaborators, has already accomplished wonderful results in the work of reorganizing medical education in the United States upon the highest possible plane. It has injected into medical education the noblest interpretation of its purposes and has brought about the discontinuance of those institutions whose aims and purposes are not in harmony with the educational ideals of that scrutinizing body of scientific men. Medical education has advanced by rapid strides in the last five years, inspired and guided in its onward march by the personnel of the General Educational Board whose existence and activities have been made possible by the princely gifts of Mr. Rockefeller. The uplifting forces of the General Educational Board in the case of medical education will now be shared by dental education, and it is this phase of the Eastman-Rockefeller project which appeals to us as being the kernel of the blessings which these two philanthropists are bestowing upon the noble professions of medicine and dentistry.

Dental education since the organization of the first dental school in Baltimore in 1840 has accomplished results which bespeak self-sacrifices and abnegation on the part of the men responsible for its continuance during all these decades with the relatively meagre facilities at their command. Dentistry should survey with pride the record of their accomplishments; they make possible the realization of the aims of the donors of these magnificent sums toward so glorious a cause as that of decreasing the physical and mental anguish of our less fortunate brothers.

The full significance of the direct interest in dental education which has been so magnanimously assumed by the General Educational Board and by Mr. Eastman, it is difficult at the present time to correctly outline, although it is easy to assume that in the endeavor to emulate the high educational ideals of the proposed institution in Rochester, dental education everywhere will be strongly stimulated, and better dentists will be graduated—men with an academic, scientific and technical training worthy of their calling and pregnant with possibilities for the physical amelioration of the present and future generations.—Editorial, Pacific Dental Gazette.

"We learn *Wisdom* from
FAILURE more
than from *SUCCESS.*"

W. H. COON, D. D. S.,

President Toronto Dental Society For Year 1920-21.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, SEPTEMBER, 1920 No. 9

The Ratio of Dentists to Population in the Dominion of Canada

THE number of practising dentists in the Dominion of Canada compared to population, has steadily increased during the past fifty years. In addition to the natural increase of Dentists corresponding to increases in population, there have occurred additional increases corresponding to the increased public demand for dental services.

The remarkable part played by Dentistry in the great war has been an important factor in the recent increases in the public recognition of the value of dental service and of the fact that in many cases the teeth are vitally associated with conditions of health and systemic disease. Science and practice have combined to prove that in the maintenance of bodily health, comfort and appearance, no other single factor is so important as that of the teeth.

The place of the Dentist in the community was never so highly regarded as at the present time and dental services never so demanded or appreciated.

The population figures used in the following comparison are those supplied *Oral Health* by the Dominion Bureau of Statistics, Ottawa, and are the estimated population of Canada by Provinces as of 31st March, 1919. The numbers of Dental practitioners are those supplied through official sources.

	Population.	Dentist.	Ratio.
Ontario	2,820,909	1278	1.2207
New Brunswick	368,760	111	1.3322
British Columbia	718,660	209	1.3438
Alberta	587,770	165	1.3562
Nova Scotia	518,761	138	1.3759

Manitoba	618,903	164	1.3761
P. E. I..	93,728	22	1.4260
Saskatchewan	754,090	142	1.5310
Quebec	2,326,528	361	1.6445

The Provinces of the Dominion have been arranged according to the number of Dentists per thousand of population. In considering these figures, however, the reader should bear in mind the areas of the several provinces, and the density and character of population.

Dominion Dental Council Examination Results, 1920

THE following candidates have successfully passed the Dominion Dental Council examinations in the subjects indicated. Unfortunately, the results of the Medicine and Surgery examinations are not ready for publication, but these will follow in a subsequent issue.

The following have passed in Anaesthetics:

Clermont, C. C.
Box, W. M.
Brownlee, H. G.
Brown, H. M.
Beach, F. W.
Buttery, G. A.
Croft, L. H.
Countryman, J. G.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Day, H. B.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Graham, C. C.
Gemeroy, G. A.
Gunter, G. A. C.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hughes, P. C.
Johnston, F. W.
Moyle, C. T.
Mann, F. G.
Milne, J. A.
Moffatt, F. J.
Morrison, W. R.
Millar. W. J. H.
Morrison, J. D.
MacIntyre, R. R.
MacLeod, W. D.
MacLachlin, L. E.
MacLaughlin, R. C.
MacKee, G. H.
McCrostie, Hugh
Palmer, A. M.
Pommer, W. A.
Ross, H. A.
Stewart, C. E.
Smith, H. E.
Wood, P. H. B.
Wilkes, W. R.

The following have passed in both Operative and Prosthetic Dentistry:

Clermont, C. C.
Box, W. M.
Brownlee, H. G.
Brown, H. M.
Beach, F. W.
Buttery, G. A.
Croft, L. H.
Coysh, B. R.
Countryman, J. G.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Day, H. R.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Gemeroy, G. A.
Graham, J. A.
Giffen, J. F.
Hartley, W. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hughes, P. C.
Hesson, E. J.
Hiscox, R. J.
Johnson, F. W.
Lapp, J. S.
Moyle, C. T.
Mann, H. E.
Mann, F. C.
Milne, J. A.
Moffatt, F. J.
Morrison, W. R.
Millar, W. J. H.
Morrison, J. D.
McIntyre, R. R.
MacLeod, W. D.
MacLachlan, L. E.
McLaughlin, R. C.
McVicar, K. N.
McCrostie, Hugh
Palmer, A. M.
Pommer, W. A.
Ross, H. A.
Stewart, C. E.
Smith, H. E.
Trueman, C. M.
Wood, P. H. B.
Wilkes, W. R.

The following have passed in Prosthetic Dentistry (Paper):

Clermont, C. C.
Box, W. M.
Brown, H. M.
Benezra, I. N.
Beach, F. W.
Buttery, G. A.
Barnes, L. V.
Croft, L. H.
Coysh, B. R.
Countryman, J. G.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Day, H. R.
Ewart, W.
Fralick, R. F.
Fraser, J. G.
Gemeroy, G. A.
Gunter, G. A. C.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hesson, E. J.
Hoar, H. B.
Johnson, F. W.
Lumb, R. J. C.
Moyle, C. T.
Mann, H. E.
Mann, F. G.
Milne, J. A.
Moffatt, F. J.
Morrison, W. R.
Millar, W. J. H.
Morrison, J. D.
McIntyre, R. R.
MacLeod, W. D.
McLaughlin, R. C.
McCutcheon, R. C.
McCrostie, Hugh
Palmer, A. N.
Pommer, W. A.
Smart, C. C.
Shultis, J, M.
Smith, H. E.
Trueman, C. N.
Wood, P. H. B.
Wilkes, W. R.

The following have passed in Operative Dentistry (Paper):

Clermont, C. C.
Box, W. M.
Brown, H. M.
Benezra, I. M.
Beach, F. W.
Buttery, G. A.
Croft, L. H.
Coysh, B. R.
Countryman, J. G.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Day, H. R.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Gemeroy, G. A.
Gunter, G. A. C.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hughes, P. C.
Hesson, E. J.
Johnson, F. W.
Moyle, C. T.
Mann, H. E.
Mann, F. G.
Milne, J. A.
Moffatt, F. J.
Morrison, W. R.
Millar, W. J. H.
Morrison, J. D.
McIntyre, R. R.
MacLeod, W. D.
MacLachlin, L. E.
McLaughlin, R. C.
McVicar, R. N.
McCrostie, Hugh
Pommer, W. A.
Palmer, A. N.
Stewart, C. E.
Smith, H. E.
Trueman, C. M.
Wood, P. H. B.
Wilkes, W. R.

The following have passed in Physiology and Histology:

Bannerman, C. J.
Box, W. M.
Barber, J. D. C.
Barton, A. J. T.
Berry, J. O.
Berst, M. R.
Beach, F. W.
Buttery, G. A.
Cummer, H. H.
Code, H. M.
Clark, V. A.
Dunbar, I. W.
Davidson, A. G.
Davidson, H. T.
Ewart, W.
Fraser, J. E.
Green, Geo.
Graham, C. C.
Gabriel, J. M.
Graham, J. A.
Herrington, J. H.
Haywood, A. C.
Heney, M. J.
Hamilton, C. W.
Hunter, W. H.
Hugill, W. L.
Hall, H. R.
Joy, Marion
Keyes, E. C.
Kerr, W. J.
Kinsman, M. A.
Lequeyer, L. J.
Lumb, R. J. C.
Langmaid, W. J.
Mills, R. J.
Marshall, H. G.
Marshall, R. J.
Marshall, T. R.
Mollins, Norman
MacKenzie, Annie S.
MacDonald, R. R.
MacKay, A. W.
MacLeod, W. D.
MacLaughlin, R. C.
McD. Allen, Norman
McDonagh, Aileen
McCrostie, Hugh
Netterton, W. J.
Niebel, G. H.
Olson, J.
Purdy, C. F. N.
Pommer, W. A.
Searle, G. D.
Stewart, C. E.
Smith, H. E.
Trowean, Z. I.
Teal, G. E.
Wood, P. H. B.
Webb, M. G.
Wilson, C. B.
Wright, L. H.
Whittiker, R. R.
Yack, L. C.
Zimmerman, J.

The following have passed in Pathology and Bacteriology:

Adams, H.
Best, J. H.
Box, W. M.
Beach, F. W.
Buttery, G. A.
Barnes, L. V.
Croft, L. H.
Corbett, F. N.
Countryman, J. G.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Day, H. R.
Elliott, C. A.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Graham, C. C.
Granovsky, T. L.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hunter, W. H.
Hesson, E. J.
Hoar, H. B.
Johnson, F. W.
Lumb, R. J. C.
Moyle, C. T.
Mann, H. E.
Mann, F. G.
Moffatt, F. J.
Mills, R. J.
Morrison, W. R.
Millar, W. J. H.
Morrison, J. D.
McIntyre, R. R.
McAllister, Ruth
MacLeod, W. D.
McLachlin, L. E.
McLaughlin, R. C.
McCutcheon, R. C.
McVicar, R. N.
McKee, G. H.
McCrostie, Hugh
Palmer, A. M.
Smart, C. C.
Stewart, C. E.
Smith, H. E.
Trueman, C. N.
Teal, G. E.
Upston,
Wood, P. H. B.
Wilson, C. B.
Wessels, W. E.
Wilkes, W. R.
Whittiker, R. R.
Zimmerman, J.

The following have passed in Physics and Chemistry:

Bannerman, C. J.
Box, W. M.
Barton, A. J. T.
Bayne, H. C.
Brownlee, H. G.
Berst, M. R.
Beach, F. W.
Buttery, G. A.
Countryman, J. T. D.
Code, H. M.
Clark, V. A.
Charles, B. J.
Davidson, A. G.
Davidson, H. T.
Fraser, J. E.
Green, Geo.
Gabriel, J. N.
Graham, J. A.
Herrington, J. H.
Haywood, A. C.
Heney, M. J.
Hunter, W. H.
Hugill, W. L.
Hall, H. R.
Knight, H. M.
Kinsman, M. A.
Keyes, E. C.
Langmaid, W. J.
Mills, R. J.
Marshall, R. J.
Marshall, T. R.
Morrison, W. R.
Mollins, Norman
Mackenzie, Annie S.
MacDonald, R. R.
MacKay, A. W.
MacLeod, W. D.
McDonagh, Aileen
McCrostie, Hugh
Netterton, W. J.
Neibel, E. H.
Stewart, C. E.
Smith, H. E.
Teale, G. E.
Wood, P. H. B.
Webb, N. G.
Whittiker, R. R.
Yack, L. C.
Zimmerman, J.

The following have passed in Orthodontia:

Clermont, C. C.
Box, W. M.
Brownlee, H. G.
Brown, H. M.
Benezra, I. M.
Beach, F. W.
Buttery, G. A.
Croft, L. H.
Coysh, B. R.
Countryman, J. G.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Day, H. R.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Graham, C. C.
Gemeroy, G. A.
Gunter, G. A. C.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hughes, P. C.
Hesson, E. J.
Johnson, F. D.
Moyle, C. T.
Mann, H. E.
Mann, F. G.
Milne, J. A.
Moffatt, F. J.
Morrison, W. R.
Millar, W. J. H.
Morrison, J. D.
McIntyre, R. R.
MacLeod, W. D.
McLachlin, L. E.
McLaughlin, R. C.
McVicar, R. N.
McKee, G. H.
McCrostie, Hugh
Palmer, A. M.
Pommer, W. A.
Ross, H. A.
Stewart, C. E.
Smith, H. E.
Trueman, C. N.
Wood, P. H. B.
Wilkes, W. R.

The following have passed in Jurisprudence and Ethics:

Clermont, C. C.
Box, W. M.
Brownlee, H. G.
Brown, H. M.
Benezra, I. M.
Beach, F. W.
Buttery, G. A.
Croft, L. H.
Countryman, J. G.
Clark, V. A.
Charles, B. J.
Day, H. R.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Gemeroy, G. A.
Gunter, C. A. C.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hughes, P. C.
Hesson, E. J.
Moyle, C. T.
Milne, J. A.
Millar, W. J. H.
Morrison, W. R.
Morrison, J. D.
MacLeod, W. D.
MacLachlin, L. E.
MacLaughlin, R. C.
McVicar, R. N.
McCrostie, Hugh
Palmer, A. M.
Pommer, W. A.
Ross, H. A.
Stewart, C. E.
Smith, H. E.
Wood, P. H. B.

The following have passed in Anatomy:

Bannerman, C. J.
Box, W. M.
Barber, J. D. C.
Barton, A. J. T.
Berry, J. O.
Berst, M. R.
Buttery, G. A.
Cummer, H. H.
Code, H. M.
Charles, B. J.
Clark, V. A.
Dunbar, I. W.
Davidson, A. G.
Davidson, H. T.
Evans, J. D. L.
Ewart, W.
Fahey, H. J.
Fraser, J. E.
Green, G.
Graham, J. A.
Herrington, J. H.
Haywood, A. C.
Heney, M. J.
Hunter, W. H.
Hugill, W. L.
Hall, H. R.
Joy, Marion
Kerr, W. J.
Knight, H. N.
Kinsman, M. A.
Keyes, E. C.
Lough, A. G.
Lequeyer, L. L.
Lumb, R. J. C.
Mills, R. J.
Milraychuk, M.
Marshall, H. G.
Marshall, R. J.
Marshall, T. R.
Millar, W. J. H.
Mollins, Norman
MacKenzie, Annie S.
MacDonald, H. W.
MacDonald, R. R.
MacKay, A. W.
McD. Allen, Norman
McDonagh, Aileen
McCrostie, Hugh
Netterton, W. J.
Niebel, E. H.
Purdy, C. F. N.
Palmer, W. A.
Searle, G. D.
Shultis, J. N.
Stewart, C. E.
Smith, H. E.
Trowean, Z. I.
Wood, P. H. B.
Webb, M. E.
Wright, L. H.
Whittiker, R. R.
Yack, L. C

The following have passed in Materia Medica and Therapeutics:

Adams, D.
Abar, H. S.
Best, J. H.
Box, W. M.
Barton, A. J. T.
Bayne, H. C.
Black, W. B.
Brown, H. M.
Beach, F. W.
Buttery, G. A.
Barnes, L. V.
Crowe, V. D.
Corbett, F. M.
Countryman, J. G.
Code, H. M.
Clark, V. A.
Caldwell, G. C.
Charles, B. J.
Doore, J. C.
Dunbar, I. W.
Dixon, E. R.
Day, H. R.
Elliot, C. A.
Ewart, W.
Fraser, J. E.
Graham, C. C.
Granovsky, T. L.
Gabriel, J. M.
Gott, G.
Graham, J. A.
Herrington, J. H.
Heney, M. J.
Hyde, R. G.
Hunter, W. H.
Hoar, H. B.
Johnson, F. W.
Kinsman, M. A.
Lumb, R. J. C.
Moyle, C. T.
Mann, H. E.
Mann, F. G.
Moffatt, J. J.
Mills, R. J.
Marshall, T. R.
Morrison, W. R.
Millar, W. J. H.
McIntyre, R. R.
McAllister, Ruth.
MacKay, A. W.
MacLeod, W. D.
McLaughlin, R. C.
McCutcheon, R. C.
McCrostie, Hugh
Olson, J.
Palmer, A. M.
Smart, C. C.
Stewart, C. E.
Smith, H. E.
Trueman, C. N.
Teal, G. E.
Upston,
Wood, P. H. B.
Wilson, C. B.
Wessels, W. E.
Wilkes, W. R.
Whittiker, R. R.
Zimmerman, J.

When to Extract and When to Conserve Diseased Teeth*

By Thomas B. Hartzell, M.D., D.D.S.,
Minneapolis, Minn.

I HAVE been particularly anxious all my life to see things as they are, and see them completely. I know of no greater error into which one may fall in teaching than, through an enthusiasm or a prejudice, or lack of analysis of any subject, seeing only a part of the subject; and no matter whether it be in dentistry, in mechanics, or in medicine, when we tear a little segment of truth out of the context, and fail to get the relationships that should exist, which help to make that bit of truth a part of the whole, we are apt to make very wrong deductions from that portion of truth torn out of the compact body which makes up the whole.

Dentistry has fallen into a very natural error, at least a portion of the members of the dental profession have done so in adopting in some part logic of the following type which I might illustrate by a familiar example: "A cat is an animal and has four legs; therefore every animal that has four legs is a cat." You tell me a cat has four legs, and I admit your premise, but does it necessarily follow because a cat is an animal and has four legs, that every animal with four legs is a cat? That is the type of reasoning that goes on at present in the minds of the people who adopt the "Hundred per cent. Vitality" slogan. Whenever you wish to arrive at a reasonable, just opinion of any type of science or truth, you want the whole of it and not a part; and I am going to attempt to paint both sides of the whole picture as I see it, in the hope that even the men who make their living by the extraction of teeth will see the justice of the position that I hope dentistry and medicine as a whole will take when the pendulum finally swings back into the position of reasonable judgment.

I suppose I have contributed as much to the "Hundred per cent. Vitality Club" of the country as any one, by giving the profession a glimpse or insight into the very damaging effects of infections that arise from the bacterial or mold-growths on human teeth. The first paper ever published on the types of infections around apical root ends, was in the *Journal of Am. Med. Association* published by Gilmer and Moody. They recited forty cases in which they had removed teeth and cultured the root ends. I commenced the same line of work one year earlier, and closed it with a paper two weeks later in the same magazine, in which I covered the result of the examination of 162 cases, in which 150 of those root ends yielded positive cultures and twelve were sterile. Then, proceeding from that, we made a study which cost the lives of two hundred or three hundred rabbits, by reason of experimental inoculations made of two types of micro-organisms of haemolytic streptococcus and non-haemolytic streptococcus. This work took a year, and necessitated the examination of hundreds of microscopic sections of the tissues of heart, kidney, muscle, brain, nerve trunk, and so on, the result of which examinations you will see in slides which have already been published.

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Growing out of the conclusions which came from the study of granuloma around root ends by many men who have contributed to investigation since, we came to the conclusion that heart, kidney and joint lesions frequently are caused by apical abscesses or granuloma. And further, the X-ray has shown that in many cases the root-canal work of the past has been very faulty; and owing to the fact, that in the beginning I was studying the question of whether or not arthritis arose largely from dentally-conveyed infections, I gathered my specimens largely from sick people in the hospital, and chose those apical infections which were obviously evident in the X-rays to be rather active; so that the first 162 cases showed 150 positive. From that alone many might deduce the general conclusion that all devitalized teeth are dangerous, which would be very wide of the truth, because we gathered our specimens from people who were ill, and we were almost certain when we gathered them that they were infected, from the evident amount of destruction around the root ends.

Growing out of that study there developed a rather positive knowledge that we could produce experimental heart, kidney, joint and nerve trunk lesions and eye injuries, and a great category of things that it is not necessary to discuss now. The fact that the Bureau of Census publishes the death rates from heart and kidney diseases particularly, and shows that heart diseases, and endo- and myocarditis, destroy about 150 people out of every 100,000 at the present time, or about 175,000 per year in a population of 110,000,000, indicates the importance of its study. And the general feeling amongst pathologists of the country that the most of the endo- and myocarditis lesions, probably two-thirds, are of streptococcal origin, lends comfort to the man who says "I will extract every dead tooth I find in the jaw," failing to recognize the fact that apical infection is a comparatively small part of the infection to which the body may be subject; failing to recognize the fact that the human intestine is about thirty-two feet long, and is full of bacterial growth from the cradle to the grave; failing to recognize the fact that in leaving pyorrheal teeth, untouched, if you have a quarter-inch pyorrheal pocket around each of the teeth, you have a cumulative surface of eight or nine inches of infected ulcer; failing to recognize the fact that gall bladder infection may exist for twenty or thirty years before it becomes so bad that the patient must be operated upon; failing to recognize that many of those individuals who yield to streptococcal infections have that slow cholecystitis of years' standing. The body of the kidney becomes infected slowly, producing Bright's disease only after many years. We have examined recently twelve hundred pairs of human kidneys, in our sarch for the whole truth.

The tonsils, too, are almost always the site of some streptococcal growth. Do you suppose, even if you do have one or two granulomata, that it is fair to charge all the ills that might arise from streptococcal invasion to those one or two, especially in view of the fact that you have thirty-two feet of infected intestine, possibly infected tonsils, possibly a cholecystitis, an old endocraditis or nephritis, or a septic purpura? Why not take *everything* into consideration when you make up youi mind whether or not you are going to extract teeth?

Do you know that in the neighborhood of forty-three per cent. of all the teeth that have cavities have infected pulps? I believe it to be true. We have recently examined 125 vital pulps.*

I am of the opinion that the average man among us does not take kindly the articles in which there appear tabulations. We turn over the pages of the journal until we come to the picture of a piece of bridge work, or a new device for attaching a plate, or a story of the sinfulness of sin. Even that little time necessary for "future reference" is never given. If you happen to have a spare moment, you play golf or billiards, or go home to play with the babies, or work in your flower beds, or something else. The dental profession never takes much time to examine into the results of painstaking work which results in tabulations. Your executive committee wrote me, when arranging for this visit, "We hope you won't present statistics!"

How are we going to get at an audience unless we give them some sort of mechanism by which they can grasp facts? If you are going to shut your minds studiously to the evidence, even though you have talents, you are going to be on the Last Day, in the position of the Unworthy Servant to whom the Lord gave the one talent, and who hid the talent in the ground, where it failed to yield an increase. You chaps who won't receive evidence really deserve to have the one talent removed from your possession, and I believe you will have it taken away.

In the future, whenever you are confronted with a case in which you find devitalized teeth, take the whole of the evidence in that case or in a series of cases, as far as you can; collect it, collate it, and when you have gathered that evidence all together and placed it before you in some form that you can readily grasp the lessons taught by it, sincerely compare them; and if you determine, after having examined that evidence, that the individual in question should have a few or all of his teeth removed, conscientiously do it; but if you find that the evidence shows no special crime attached to the devitalized teeth, leave them in position.

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Would any single one of you willingly go to a surgeon who had the reputation of operating on every patient who came into his clutches, provided he could get the patient to lie still long enough? Would you not prefer going to a man that you knew would faithfully endeavor to ascertain whether or not an operation really were needed? If it were a dear member of your family, I know you would prefer to trust your dear one to the judgment of the latter type of man.

The general public is rapidly becoming much better able to judge us than in years gone by. Information in regard to diagnosis, etiology and disease is being disseminated from every centre of health interest in this country. The goverment is disseminating it, and the states; and the more public-spirited physicians and dentists are earnestly spending much of their valuable time in educating the public; and the public is learning to discriminate between sane judgment and the lack of it. I know of nothing more damning, more certainly destructive to an honorable and useful position in society, than for a man to gain for himself the name of being an ill-balanced counsellor.

Dentistry unquestionably is attaining a place in medicine which never will be wrested from her, *providing* she endeavor to use *pure judgment*, and not prejudice nor imagination; and the question whether diseased teeth should be extracted or not should rest on a *careful examination* of the *clinical* history, the *personal* history, the *X-ray examination* of the whole body, and particularly of the mouth and jaws; the examination of the *blood-stream*, haemanalysis, and an analysis of the urine, to know whether or not you are dealing with a nephritic. The blood-stream gives us the best evidence of one's resistance and ability to cope with infection; and, whenever you consider the matter of destroying the human masticating mechanism, you should weigh with the conditions of pathology that you may find, the further knowledge or evidence of *how much damage you are going to do the nutritive mechanism.* You should remember that every grain of food which is consumed to be translated into human energy must be masticated and digested if it is to serve its purpose. You should remember that when you compel a patient to ingest food without having masticated it and thoroughly mixed it with saliva, you have robbed him of the most valuable part of the digestive process, and thrown a burden on the stomach that it often can ill afford to bear, thus creating conditions worse than those you seek to remove by extraction.

Far be it from me to condemn the man who removes a badly-infected tooth. I do not advocate the retention in the human jaw of teeth carrying infection into the blood-stream. I remove them. A patient came to me six weeks ago with a pulse of 110 to 120, sometimes 130; a low blood-pressure, indicating a weakened heart action, evidently a myocarditis. The patient had quite a number of teeth in the jaws. There were pyorrhea pockets around many of them, and in a nearby clinic the advice to go home and have all the teeth removed had been given as conclusive. The patient had all the teeth on one side back from the cuspid removed, and got so much *worse* that the family became alarmed about the lady's life. I examined the patient, found the low blood-pressure, the rapid pulse. She was then running a temperature of ninety-nine and one-half to one hundred from day to day. I found that she had almost a normal haemoglobin. I found she had 4,500,000 red cells to the cubic centimeter, which is within 500,000 of normal—a comparatively innocuous anemia. I found she had leucopenia, or poverty of leucocytes. The only way to build up that woman's heart muscle was through proper feeding and resting that muscle. I found the mouth to contain a few devitalized teeth, but *none* of them presented apical abscesses or granulomata. The roots were faultily filled, and there were around the root ends those areas that one ordinarily might interpret as granulomatous areas. Could I have been justified in ripping out the balance of that mechanism, leaving that woman incapable of nourishing herself normally during the period when she should have been resting in bed, resting and building up her heart muscle? I did not believe I was so justified; and instead of extracting those devitalized teeth, I gave her digitalis, the infusion. I gave her an ounce at a dose, soon cut it down to half an ounce, and then to a drachm, three times a day. That quiets and strengthens the heart beat; and, if the patient is kept at rest and is well fed, the heart muscle soon begins to recuperate and repair itself.

I had the pleasure of seeing that patient regain an almost normal heart action before she left me to go to a Southern city. If she hurried, the speed of the heart would leap up, but it was running, regularly, from seventy-two to seventy-eight per minute, and the digitalis had been cut off. That repair came by reason of the fact that we fed her to the limit. We took pains that she chewed every grain of food she ingested until it was liquid, relieving the stomach of the tremendous loss of energy caused by churning lumps of food over and over in the effort at digestion until finally the pepsin and hydrochloric acid succeeded in breaking them up and changing them into chyme and chyle, which the patient could absorb and convert into real food. If I had removed those teeth, the patient would be in bed today and probably would remain there and repair never have been accomplished.

Very frequently patients of that sort grow steadily worse and eventually die. There was an opportunity to exercise judgment very much at variance with the individual who says, "Here are some dead teeth. Hartzell says these teeth are infected. Out with them!" Men who render such decisions based upon any teaching of mine have not considered the context. They have taken in only a small portion of truth on that proposition, and have acted in a prejudiced manner on that small portion of truth. The context tells you to examine the *whole body*, and to *know* the disease from which your patient is suffering; and if it is a disease of the type I have just described, you are doing that patient a positive damage to go into surgery at a time when the heart and the nervous and intestinal mechanisms demand the opposite of ruthless extraction.

About two years ago a man of wide influence in the state of Dakota was brought to my office by his dentist with a myocarditis that had so weakened him that he could not walk over half a block without sitting down to rest. His mouth presented many devitalized teeth, and as I felt convinced that his only lay in the removal of those teeth, I proceeded to take them out. I told him what I supposed to be the trouble, and why he had myocarditis, and that the removal of those teeth was necessary before any recovery could be expected. I told him that if I attempted to remove them all at once, he probably would be very ill, if not lose his life. He accepted my suggestion, and we commenced removing the teeth, one or two at a time. At the end of two months we had all but three out, and he had gained in heart strength so that he could walk half a mile, and felt well; and he was determined upon going back to his business in spite of my urgent request that he abstain from much expenditure of energy until we had finished with the case. One day he came into my office by appointment, having three devitalized teeth yet in his mouth, and giving evidence of the very fine improvement mentioned. He said: "Hartzell, I am getting tired to death of not having anything to chew with. I think I could bear to have these three taken out today." I said, "All right; I will remove them; but I want you to promise me that you will go back to the hotel and stay in bed at least twenty-four hours." He said: "All right." I removed them. I went over to the hotel at the close of the day, and was told that he had checked out. The next day I had a telegram from his home town in Dakota stating that he was dead. He had sunk down while addressing a religious meeting, and never regained consciousness. I had removed three teeth, and had thereby sprayed a shower of bacteria into his blood-stream. Instead of going to bed and resting until the leucocytic body had cleared up that infection, he got on a train, went back home, overtaxed himself, pumped that poison through the whole system, and died of heart failure.

I believe this man would be alive to-day if he had followed my plain directions. The trouble was, as it so often is, that he was improving so rapidly that he felt better than he really was, as usually is the case, because the revival of recuperative energy always precedes repair. The most successful physician always is the best nurse. He compels his patients to remain quiet until repairs are complete.

We as dentists need to study the grave diseases that are caused by these infections. I have stimulated the formation of study clubs for the purpose of mastering diagnosis, and of getting a first-hand acquaintance with the diseases that interlock with dental infections. You should know everything to be known about myocarditis, endocarditis, nephritis and arthritis. You can get it if you choose to take up the study, and you would find the interest in it growing upon you. If you could form judgments that would be just to your patients, then you could handle these cases intelligently and render correct service.

You say to me, "I have been extracting teeth in great numbers all my life and never had anything of that kind to happen." *How do you know?* How many of you, having a death following extraction, ever attribute that death to the extraction? Death does not always occur right away. How many are able to trace every case to see what happens?

I once was called into consultation on a patient who had a nephritis, and there was a bad condition of dental mechanism—pus flowing freely and teeth loose; and it was obvious that those teeth should be removed. My friend said: "I will give the ether; and you take out the teeth." We proceeded with the operation, and the third day afterward the patient died. I know I created an intense nephritis, an acute condition, and the patient died of uremic poisoning. If we had taken out one tooth, and waited until the bacteria had been destroyed by the leucocytic body, and then another one, and so on, we would have worked out the toxins gradually, and the patient would have lived out her full term of years. I did not know that I had killed her until years afterwards; but I remembered all the circumstances, and as my judgment grew and I became more able to see things in their true light and *as they really were*, I recognized that that patient lost her life through my poor judgment based upon incomplete knowledge of conditions existing in her case. When I began dimly to see what I believed to be truth about it, I began to make complete diagnoses, and to so apply my remedial measures that I could make my patients better, instead of taking a chance with their lives. I now want *all* the truth, not a small segment of it; for I have well learned the truth of the old saying: "A little knowledge is a dangerous thing."

The man in general practice who does not deal with sick people in the main, does not see this type of case often enough to form clear judgments, *unless* he is looking for them. If he has been educated to make crowns and bridges and do other dental repair merely, and a patient comes into his office, he sees only the part that requires attention, only the mouth and the buccal apparatus, and usually only a small part of that; and the patient goes away and dies a few days or a few weeks after the service. He doesn't take any blame on himself. Ignorance in that case is bliss. But if the ignorance is realized later, the new vision brings self-condemnation and sadness; and to the honest man who shortens a life, it means internal sadness and real sorrow, and an ache that goes with him through life. *The fact that he did it ignorantly does not make it any the less true that those lives are gone, shortened through his ignorance.* That is the condition that I seek to remedy. I want to save you that ache. So I plead with you, even though you make your living by extracting teeth, that you stay your hand, and *really* examine all cases, and know of your own knowledge whether or not teeth should be extracted.

There are two sides to this question, one the side you have been stimulated to see, since we have come to this knowledge of the severe and sometimes deadly effect of infections that find their way into the blood stream slowly through lesions about the teeth; it has embarrassed us all, and we want sincerly to act upon this new knowledge in order to remedy the ills shown in many cases to exist; but there is danger that we have very great need to study the *other* side in order not to do harm when we intend to do good.

I am an advocate of an even, sane, balanced judgment. I am not a "hundred per cent. man," nor am I one who condemns the practitioner who takes out devitalized teeth *when* they ought to come out. We should be able to form an accurate judgment, and and act on it in such a way that the patient will be benefited, and the dentist be able to say, "I have done the thing I should want to have done if I had been the one seeking advice rather than the one giving it."

I am neither for nor against extraction *in toto*. When a physician sends a patient to you with the demand that you do some certain thing, you should use your own best judgment; and if that judgment demands that what the physician orders be not done, you *should not* carry out his demands, until he can *show you* that your judgment is incorrect, and that his demand is justified by the best reseults in *service* to the patient. I thank you.

DISCUSSION.

QUESTION: Is iritis usually of streptococcal origin, or may it result from venereal origin occasionally?

DR. HARTZELL: Iritis is very often due to gonorrheal infection. It is very readily recognized both by microscopic examination and by its clinical picture. Chronic iritis often is due to syphilis. Poynton and Paine, of London, created experimental iritis in rabbits in 1914. Since that time I have paid particular attention to it, and have recognized fifty cases. The Wassermann should be resorted to in these cases. It is seldom that patients suffer from one thing alone. They show two or three different types of lesion, and that is why you should determine from what one or more the patient is suffering. If you have a patient with one or two chronic types of lesion, and you promise to cure him by extraction or anything else, you are running a grave risk.

QUESTION: Contrast treatment of case of leucopedia and slight anemia, with twenty-five thousand leucocyte count, with normal red cell count?

DR. HARTZELL: The finding of as many as twenty-five thousand leucocytes in the blood stream is probable evidence that the patient is suffering a deep and damaging infection of some type.

QUESTION: Is root resection generally advisable?

DR. HARTZELL: No, sir; it is not. I do dozens where I used to do hundreds. Root resection never should be done unless you are positive that the root tissue is sterile and the gingival attachment perfect, because if it is infected it will replant in the site from which you have cut the root and curetted. And if the gingival margin is broken, and the patient is growing a coat of bacterial mold on neck of the tooth, it will infect the granulomatous area again. I do not think you ever should amputate teeth in pyorrhetic mouths.

QUESTION: How long does it take patient to recover from arthritis after operation?

DR. HARTZELL: Many of them never recover. You will not have fifty per cent. of cures, and you will be lucky if you have twenty-five per cent., because most of these arthritic cases have two or three other infections running with them. Many are tubercular. Don't make promises on arthritis.

QUESTION: In cases of recovery in arthritis is recovery permanent?

DR. HARTZELL: If the dental lesion is the sole source, you will have a permanent recovery. If you have removed the sole and only source by your dental treatment, you will not have recurrence unless new sources of infection have arisen in the meantime.

QUESTION: Detail your method of extraction and removal of granuloma.

DR. HARTZELL: I am out of sympathy with alveolectomy, because the patient has a right to expect that when his teeth are removed you will provide him with a dental mechanism that will enable him to masticate his food; and when you try to rid the mouth of infective areas by chiseling away everything between the clavicle and the eyebrows, you do not leave a very good foundation for the prosthetic man! When I remove granulomatous teeth I generally use novocain, and wait until the bleeding ceases; then curette everything out of the socket and out of the expanded area that the granuloma has created; I reflect the light into the area and actually see that I have it all; and if bleeding continues I use hot packs and other methods of checking the flow until I can see that all the infected and connective tissue has been removed, and I "tent" that until Nature builds a good healthy coat of granulation tissue into that socket. I do not pack it with gauze; I just "tent" it with the gauze.

QUESTION: Would you resect where a granuloma is present which is giving no apparent trouble?

DR. HARTZELL: That would depend on the condition of the patient. If I could assure myself that the root was sterile inside of the root-filling area, and the gingival margin perfect, I think I would. If I thought the patient was in a condition that did not justify surgical interference, I might for a time let it pass; but I would make a record of it and keep close watch of the patient. If everything went along, I might let him carry that handicap for a while, but I would make a record of it and write him a note telling him what I thought of the condition and of the danger, and the advantage of leaving it for the time being.

QUESTION: If you were suffering from any chronic physical condition, at this time considered a sequela of subacute infection, would you favorably consider the removal of your pulpless teeth, no rarefaction being evident; or would you consider it expedient and wise to retain the teeth?

DR. HARTZELL: I would retain the teeth. I had some casts and albumen myself some years ago, and I had two devitalized teeth at that time, and I still have them.

QUESTION: What is your opinion of curettage of sockets of pulpless teeth?

DR. HARTZELL: I always curette and almost always "tent." That is not as pleasant for the patient as to have the blood clot form and have it heal, but it is better.

QUESTION: Please explain why broth culture, positive, injected into rabbit in one case produced death, while in another case organisms from pulpless teeth produced death. Do you mean to say the organisms were of the same strain?

DR. HARTZELL: Probably not the same strain. There are many families of streptococci. We find we can take virulent organisms and grow them on a medium inimical to their growth, and produce non-toxic organisms. We can take non-toxic organisms and place them on certain media, and make them death-dealing.

QUESTION: What percentage of streptococcic and staphylococci infections did your cultures show?

DR. HARTZELL: I do not know that I can answer that accurately, because I do not remember. In granuloma, streptococci occur almost universally, and the staphylococcus seldom. The staphylococcus that grows in any plaque may create pus. The streptococci of the non-haemolitic type almost never creates pus unless it has been activated by growing under very favorable conditions. You cannot have a staphylococcal infection long without suffering a lot from it. The swollen face is a staphylococcal condition.

QUESTION: Referring to the case of carcinoma of antrum, how could that dentist have made a different diagnosis than he did?

DR. HARTZELL: He could have looked into the antrum and seen that it had a mass of solid growth in it. If you find solid growth, granulating in character, you had best assume that to be malignant, and you should get a bit of it out and have it examined under the microscope, as I did in this case. If you think this may be an operable condition, have everything ready to complete a major operation at that time, because every time you disturb a carcinoma with a knife, no matter how small the disturbance, you run the risk of setting loose carcinoma cells that will plant themselves in other parts of the body. Bacteriologists use the freezing microtome, and the diagnosis comes back in five or ten minutes, and the surgeon goes on and completes the operation, guard-ing the patient from the diffusion of an operation to-day to find out, and an operation tomorrow to remove. The major operation should be done within ten minutes of the time when the wound is touched. Many a woman has lost her life because she goes to a physician, and there is a little lump in her breast, and he takes it for granted it is a fibroid, and he takes it out. The wound heals, and then three or four months afterward she finds other lumps, and goes to a good surgeon, and he finds it has been scattered, and that nothing can be done.

QUESTION: With dentally-induced infection, lesions of nerve trunk, what is prognosis after removal of foci of infection?

DR. HARTZELL: The prognosis is good, but the result slow in arriving, because the patient who suffers streptococcal invasion and has a reduced leucocyte count and anemia with it, must be built up before the blood will clear the secondary lesion. The patient should be put to bed, and fed the most nutritious things possible, and given the maximum of rest and minimum of exercise. These cases take a long time, but most of them eventually repair.

QUESTION: What should we say to the physician who demands extraction of all bad-looking teeth?

DR. HARTZELL: I feel like telling him to go to ———! Actually I do not, because I do not care to sacrifice his business if I can save it! I give him enough evidence that I know what I am about, so he doesn't require me to do it.

Sub-Infection and Local Infection*

BY J. G. ADAMI, M.D., F.R.S.,
Vice-Chancellor of the Liverpool University.

MAY I in the first place express to you the pleasure that I feel in being with you to-night, and in being invited to address this society. It is really rather wonderful the reception I have received here in Liverpool—the cordiality and warmth of that reception . My heart responds to it. I come here particularly interested in your profession, and wishful that that profession shall obtain throughout the country and the Empire the position that it deserves. Let me assure you that as head of the university I am most anxiously desirous to see the profession placed in its right position. (Hear, hear.) Now with regard to the subject which I have chosen for this evening's talk, may I say that although my work of twenty years ago is in its application, I think, of peculiar importance to the dental profession, it so happens that throughout my residence in Canada I was never once invited to address any association of dentists and so bring it directly to the notice of the profession. Looking back, this is curious, for it was my fortune to deliver more addresses than fall to the lot of most medical men, and that not merely from one end of Canada to the other, but, in addition, from Denver, in the north-west, to New Orleans in the south, and Boston in the east of the great country below the boundary line. Possibly it was due to the want of full organization of the profession in Montreal, more probably to the sound state of my dentition, that I did not come into intimate contact with my dental colleagues there. When, therefore, your secretary courteously invited me to give a paper before this society, even though my matter may seem sadly belated, and I repeat much that I have published in the years gone by, I trust that you will forgive me if I choose as the basis of my remarks those early observations upon a subject which to-day I know interests you greatly.

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*Read before the Liverpool and District Odontological Society, February, 1920, and published in The Dental Record of August, 1920.

In these latter days, when we are having impressed upon us the relativity of truth, and are being advised to think—if we can—in four dimensions, when all our physicist friends join in assuring us that the law of gravitation, which we had accepted as the verity of verities is, if not a vanity of vanities, at most an imperfect approximation to the truth, it may be worth while to recall the attitude of the medical world in the last quarter of the nineteenth century regarding the sterility of the tissues. The basis of Lister's procedure, a procedure which had absolutely revolutionized surgery, which had made possible operations which, as you know, could not even be dreamed of before the late seventies, the basis of antiseptic and aseptic surgery which in our generation has saved countless lives, is that the healthy tissues are sterile, and that provided no bacteria are introduced into the wound made by the surgeon, either by his hands or from his instruments or from the surrounding air, then the wound, in the absence of introduced bacteria, must heal by first intention. Now the very fact that in so large a number of cases where Lister's precautions were carried out faithfully all went well appeared to confirm this law of the pristine sterility of healthy tissues, and everybody believed in this sterility of the tissues and of the blood, save in cases of obvious general or local infection.

I well remember the trepidation with which, before the Pathological Society in Chicago, in 1899, I went against the commonly accepted belief, and asserted that this law was only approximately correct, and that in health the tissues are only potentially and not essentially sterile; that bacteria are constantly throughout life passing through the mucous membranes into the underlying lymph and blood vessels, and are liable to be carried to distant parts, there under ordinary conditions to be rapidly destroyed—under other conditions, as, for example, when the validity of the tissues is lowered, or the circulation of such an order as to favor their arrest, to affect a lodgment and multiply, and through their toxines to set up local irritation and disease.

In saying this I do not wish you to think that I claim credit on having been the first to recognize the existence of bacteria in apparently healthy tissues. That is very far from being the case. With singularly rare exceptions, all that anyone can claim in science is to have laid another brick or two upon the wall built by his predecessors. My own observations, more particularly, were built upon those of my friend and co-worker at Cambridge, the late Sir Armand Ruffer, in the late eighties. Ruffer had demonstrated that, taking the small intestine of healthy rabbits immediately after killing them, hardening these in absolute alcohol, cutting and staining, leucocytes could be seen on the free inner surface of the gut, others between the epithelial cells of the mucosa, some of them containing microbes, while in the lymph nodes which form the Peyer's patches there are to be found bacteria in great numbers. He demonstrated the same state of affairs in the tonsils. To him we owe the first absolute demonstration of this passage of bacteria by the agency of the leucocytes from the lumen of the alimentary tract into the healthy tissues. Ruffer was a pupil of Metchnikoff, and he was mainly concerned in demonstrating the phagocytic activity of the wandering cells of the organism. Other observers, like Biedel and Kraus, Cotton, Pernice and Scagliosi, Posner and Levin, were concerned in showing that bacteria entering the blood from the alimentary tract underwent discharge through the kidneys and liver. To my knowledge I was the first to lay stress upon the recurrent entrance of bacteria of low virulence from the alimentary tract as the cause of chronic disease.

I was led to this by studies which I carried out in Nova Scotia, in 1895, for the Government of Canada in connection with a curious localized disease of cattle, characterized by ulceration of the fourth or true stomach, swelling of the mesenteric gland, and an extensive cirrhosis of the liver. I am not going to inflict a full account of this disease upon you; suffice it to say that from the liver juice, the bile, and the mesenteric glands I obtained what at first I took to be diplococci, which gave me a huge amount of trouble. I detected these diplococci in the liver cells, and early cultures showed the same; older cultures seemed to be contaminated with bacilli having the properties of the B.coli. But when now I turned to ordinary portal cirrhosis, or Gin-drinkers' liver in man, I found these minute diplococci in the liver cells, and in my first three cases got the cultures contaminated, as I thought, with colon bacilli; then in a fourth case I solved this problem. A twenty-four hours' culture at 37°C. upon glycerinated agar gave me minute diplococci, along with what were apparently diplococci, but what on careful focussing showed themselves to be oval bacteria with a deeper stained mass at each pole, and other forms which were short bacilli stained evenly throughout.

In seventy-two hours these gave place to long bacilli. At last, in a culture that had been kept for some days, I obtained the solution. Overstaining with carbol fuchsin and decolorizing in absolute alcohol, I obtained long bacillary forms showing a discolored sheath, in which, scattered at regular intervals, were pairs of dots, deeply stained. Those pairs of dots in size and appearance resembled the diplococoid form seen in both cultures and in the tissues. As Dr. Maude Abbott, Dr. Nicholson and I subsequently pointed out, I had lit upon a hitherto undescribed phase in the life history of B.coli. Within the tissues the B.coli may manifest itself in a resistant form, breaking up into short lengths, and in each stumpy segment the chromatin, or coloring matter, contracts into polar bodies, so that it resembles a minute diplococcus. Rarely there are three, not two of these bodies. These bodies are not spores in the ordinary sense of the term. They have, that is, only relative powers of resistance, and one finds in the cells and tissues a series of forms from relatively large and sharply defined diplococci with a definite halo round them—that halo being the bacillary body—to smaller forms also well-stained and sharply-defined and with a halo, to others minus the halo and irregular in shape, staining with difficulty, and when unstained having a brownish tint. If sections be treated with acetic acid to clear them, these somewhat irregular brownish diplococcoid bodies stand out quite distinctly. Since many of these are to be seen in the sections and comparatively few yield cultures, it appears that these pigmented forms are dying and dead. The smaller forms are extraordinarily minute; they cannot clearly be made out by the one-twelfth inch immersion lens. They need the one-eighteenth or one-twentieth or corresponding apochromatic lenses for their study, and even then the shrunken irregular diplococcoids give the observer great pain to decided their bacterial nature.

I have described these diplococcoid bodies at some length because only during this last year or two has the existence of these phases in the life cycle of bacteria become a matter of wider interest, more particularly in this country, owing to the work published by Hort upon the existence of distinct phases in the life history of more than one of the pathogenetic bacteria—the meningococcus, the organism of typhus and the typhoid bacillus—and the possibility that virulence and infection are particularly associated with one phase of the cycle. In the United States, too, a contest has been waged between the Rockefeller school in New York and the Mayo school in Rochester, Illinois, as to the causative agent of acute anterior poliomyclitis, the one finding a minute filterable organism, the other a definite bacillus, and it has been suggested that these two organisms are merely phases in the life history of one and the same microbe. These minute diplococcoid forms are so small that they might easily pass through the bacteriological porcelain filter.

The brown pigmentation of these diplococcoids and their position in the liver cells in certain advanced cases of cirrhosis led me to investigate that other condition in which there is extensive pigmentation of the liver cells, namely, pernicious, or as Hunter prefers to term it, Addisonian anaemia, and there, to my surprise, I found that the intracellular pigment had the same diplococcoid arrangement. Doubtless all here present will know how Hunter's observations upon the glossitis of pernicious anaemia led him to further studies upon oral sepsis, and how these studies have materially influenced the dental profession. I had been a co-worker with Hunter at Cambridge when he was John Lucas Walker student of pathology there, and when, in 1888, he published his first notable paper on "Pernicious Anaemia and Its Toxic Nature," it was odd to find myself coming independently and by a totally different road to the conclusion at which he also arrived, that the basis of the conditions was an infective process, originating from the alimentary tract.

Hunter about this time concluded that the glossitis was associated with streptococci. I, through the observations of one of my staff, Dr. D. Anderson, that the stomach contents afforded almost pure cultures of B.Coli, thought to find here indications that again one dealt with a chronic coli infection. The interesting point is that, as is well known to-day, certain strains or species of streptococcus are strongly haemolytic, breaking down the blood corpuscles and liberating their haemoglobin, and one might well associate the great blood destruction in Addisonian or pernicious anaemia with the constant infection or sub-infection from the mouth and stomach by means of a haemolytic streptococcus. But the same is true, as demonstrated in my laboratory by Dr., now Professor, W. W. Ford, of Johns Hopkins, as regards certain strains of B.Coli, while another worker in my laboratory, Dr. Charlton, by inoculation into rabbits of dead cultures of non-virulent B.Coli obtained from rabbits' intestines, set up in them a profound anaemia with great reduction in the number of red corpuscles, poikilocytosis and other blood changes characteristic of pernicious anaemia, and even disturbances of the lumbar spinal cord with partial paralysis of the lower limbs, such as is seen in advanced cases of the human disease.

There for the time being the matter rests; it is quite possible that the diplococcoid forms seen in the liver represent streptococci, for in the tissues streptococci are more frequently present as diplococci, *i.e.*, sets of two members, than as long chains of cocci. I have freely to admit that the appearance of diplococcoid bodies, unless confirmed by obtaining pure cultures, does not by any means necessarily indicate the presence of B.Coli.

This, however, I want to emphasize, first that the colon bacilli can exist in the tissues and fluids of the body in this diplococcoid modification—an observation confirmed, I may add, some years ago by Wolff-Eisener in Germany—and that many other bacilli may exhibit this modification. Only a fortnight ago I spent the evening with Sir Kenneth Goadby, studying his wonderful series of sections from cases of latent infection. Since the beginning of the war Sir Kenneth has specially devoted himself to the bacteriology of war wounds, and more particularly to the cases of recurrent infection. It has been quite a common observation that a wound may be apparently completely healed for long months, and then become the seat of renewed acute inflammation; or again, that upon opening an old wound that has been healed for months, despite the most thorough asepsis, the tissues that have been cut into become the seat of acute inflammation, of gas gangrene, for example. After such cutting into healed tissues even tetanus has developed. Goadby's sections through such tissues and into decalcified bone removed from such areas amply prove how this came about. He has exquisite specimens of tissues from the neighborhood of old wounds, removed one, three and even five years after the inflammation has subsided, and in these can be seen the bacteria still present. Here is the remarkable point: Although cultures made from the tissues at the time of removal gave most often mixed growths of bacteria of various orders, showing that the bacteria in the tissues still, many of them, retained their vitality—streptococci, B.welchii, gas gangrene bacilli and other anaerobes, and B.coli—the sections, with relatively rare exceptions, showed diplococci and the minute diplococci bodies I have described to you. There were never chains of streptococci; there were few long, well-formed bacilli, and Sir Kenneth had come to the same conclusion as I reached years ago, that those diplococcoid bodies represent the resting state of many forms of bacteria within the cells and tissues of the organism. He has published photographs of many of these sections in the *Lancet* of a year ago, but, as too often happens with photos, these do not show the bacteria clearly. It is not a little interesting that as a I came away from the house of this leading modern exponent of oral sepsis in Harley Street and passed along Cavendish Square I ran across the other English medical man who has done so much to draw attention to the importance of this subject, Dr. William Hunter.

So much for latent infection. Now to pass on to the other half of my subject matter, Sub-Infection. I want, during the remainder of this address, to place before you the doctrine of Sub-Infection, which I brought forward in 1899, and its bearing upon your work as dentists. In latent infection we deal with a late resultant of previous acute infection, due to the persistence within the tissue in a latent state of certain of the bacteria which had set up that earlier acute infection. Now, through some irritation of the part, or lowered resistance there, these bacteria resume active growth, "flare up," and induce a renewed period of active disease. By Sub-Infection I mean something quite different. I have pointed out to you that constantly throughout life there pass out through the mucous membranes on to the surface phagocytic leucocytes—polymorphonuclear —whose functions apparently are of the scavenging order, to cleanse the surface. You have only to hold out your tongue, apply a clean slide to it, dry, and stain it with methylene blue or any other simple stain, to assure yourselves of the abundance of these wandering out leucocytes and to observe how they have taken up and fed upon the yet more abundant surface bacteria. You have only to cut sections of the tonsils, the Peyer's patches or mesenteric glands, to assure yourselves that some of these wandering out leucocytes return to the fold with their contained bacteria, there to complete the digestion and destruction of these bacteria.

It is interesting to note that the biggest accumulations of lymph nodules along the course of the alimentary canal occur just at those points in the course of the alimentary canal where there are the greatest number of bacteria and most favorable conditions for their growth, namely, in the pharynx (the tonsils) and the lower end of the small intestines—the Peyer's patches. They are placed here as filters. There is one other important filter: leucocytes wandering back into the mucous membrane of the stomach and intestines may find their way not into the lymphatics but into the capillaries of the portal system and, doing this, may be carried into the liver. One has only to inoculate bacteria into the peritoneal cavity or into a branch of the portal vein, and in the course of a few minutes to remove the liver, to see how this also functions as a filter. The endothelial cells, lining the liver capillaries, or sinusoids, can be seen to have taken up the bacteria. By what process they subsequently pass these on to the underlying liver cells proper I do not know. I would only point out that the diplococcoid form I have described to you can subsequently be detected in the hepatic cells and in the bile.

In ordinary health the process stops here. But if from any cause there is induced a congestion of the mucous membrane, then there is increased passage out of leucocytes, followed by increased passage in of the same, bearing bacteria and necessitating increased phagocytosis and increased destruction of these bacteria in the first place by the leucocytes; or, if those fail to act, then by the endothelial and other cells of the body. Take, for example, the case of the liver . If more bacteria be brought to it and taken up by the liver cells a strain is thrown upon these cells. You must remember that the greater number of bacteria do not actively discharge toxins; it is only the diphtheria bacilli and a few others that actively produce ectotoxins. The majority of those having any order of virulence possess endotoxins—that is to say, they liberate their toxic bodies when they are being disintegrated and dissociated. Thus an excessive destruction of bacteria by the body cells leads to a process of poisoning of the cells, and so favors degenerative changes in those cells which may culminate in the death of the same.

There is in this process, you will observe, no necessary multiplication of the bacteria within the system, but, on the contrary, destruction of these bacteria. It is this process of destruction of the coincident liberation of the toxins that sets up a series of degenerative and necrotic processes in the cells in the area immediately around those cells (through diffusion of the toxins). Following up such localized cell destruction, we are apt to see replacement of the dead tissue cells by fibrous tissue.

It is this series of changes that I refer to as included in the condition of sub-infection. Let me repeat: Ordinary infection carries with it the idea of multiplication of bacteria within the tissues. In this condition there is no such multiplication of bacteria. I am inclined to consider that many of those conditions of progressive fibrosis of the various organs which we speak of as chronic "——itis" are due to this increased carriage into the tissues of bacteria from the mucous surfaces of the body.

I admit that the boundary between sub-infection and active infection is easily broken down. The growth of bacteria within the tissues is controlled by the protective powers of those tissues. Bacteria which under ordinary conditions in the normal individual would be rapidly destroyed may gain a footing and grow if the defensive powers of the body become lowered. Thus I am inclined to think that the abundant bacteria which may be found in the blood and the tissues just before and immediately after death, setting up what are known as "terminal infections," are due to this growth of these bacteria of low virulence which is permitted by the lowering of the tissue resistance as the result of chronic enfeebling disease of various orders. Similarly bacteria which in the stronger state of the body at most set up sub-infections, may eventually induce active infection. I would suggest that we see this alternation in the recurrent relapses and periods of quiescence in, for example, cases of rheumatoid arthritis. Now notoriously the mouth is a favorable region for the multiplication of bacteria, and as such the mouth may be, or I should say, must be, a most favorable region for excessive passage of bacteria into the underlying tissues, whence they may be conveyed to other parts of the body. Particularly must we look for these developments where there is chronic inflammation and congestion of the mucous membrane; still more where there are conditions of ulceration through which the protective mucous membrane is destroyed.

One word of warning I want to give you—that this process may occur through all mucous membranes, and is not confined to the mouth, but may occur along the whole extent of the alimentary canal. More particularly during the last few years attention has been called to the fact that the genito-urinary tract is a frequent site for the development of these conditions of sub-infection, the pelvis of the kidney, the bladder, the prostate, the seminal vesicles, etc. It is absurd to put down every case in which there are rheumatoid manifestations to ulcerative gingivitis or abscesses at the roots of the teeth.

These are the main points that I want to bring before you to-night. I may just here point out again that one foresaw this matter twenty-one years ago, in 1899. An address which I gave in Chicago, in 1899, in which I enunciated this doctrine of sub-infection, concluded with these words: "I am now very careful not to state that the colon bacillus is the primary or essential cause of either cirrhosis or pernicious anaemia; indeed, I think that it is probably not, that in either case there is some primary and underlying factor favoring its entrance into the economy. This, however, I do say—that a study of these conditions does confirm in the belief that the constant destruction and taking up of excessive numbers of these, and it may be other bacteria of similar pathogenetic powers, do affect the cells and do affect their activity. These observations, therefore, in my opinion, confirm a belief in the existence of what I have termed sub-infection. Nay, more, I believe that in the development of many chronic fibroid conditions this sub-infection will be found to play a definite part."

DISCUSSION ON DR. ADAMI'S PAPER.

THE PRESIDENT: I knew when it was announced that Dr. Adami was going to read us a paper we should have something that we should always remember. We noticed how Dr. Adami uttered a word of caution. Perhaps I am right in saying that where specialists may walk freely we as ordinary practitioners have to walk warily. So we were very pleased to find that Dr. Adami gave us this word of caution that we should not always take things just as they appear. What I mean is, as you have emphasized to-night, that we may have dangerous organisms in the system, but that it needs the lowered vitality of the system to have effects such as anæmia, etc. I was particularly interested in what you said about Sir Kenneth Goadby, when you mentioned about the case of wounds that apparently have been healed, that liven up again. It rather brings to my mind the thought that that is probably what occurs in so many chronic abscesses that we meet with in everyday practice. I should like to ask whether you are of opinion that we are overdoing it in the matter ot X-ray photography from a dental point of view. Our expectation of your coming here to-night has been more than fulfilled in what you have brought before us.

Mr. W. H. Gilmour: Dr Adami, I cannot thank you sufficiently for the address you have given us, more particularly for its lucidity. I do not think anybody in this room, however difficult the subject may have been, could have had a more enlightening view than you have given us. To me it has been an entertainment as well as knowledge—the simple language in which you have explained it. I cannot pretend, sir, and do not pretend to criticize the remarks you have made, or the findings at which you have arrived. I feel exceedingly diffident in offering any remarks. The subject of sub-infection certainly opens a definite line of thought. Pyorrhœa, oral sepsis, and so on, have become a kind of fashion amongst medical men. I am pleased to note that you have made a remark or two which is exceedingly gratifying, because you do not think that all the ills for which there is no apparent cause, arise in the mouth. I think we have been conscious of that for a long time. We know that there are many cases in which there is apparently sound dentition, in which the soft tissues are the cause. On the other hand, there are many cases where the medical man, being puzzled for some cause, looks into the mouth, sees the gold crown, and says: "That is it." There are other places in that mouth, perhaps, where teeth have been filled, where there is much more likely to be absorption of organisms, which are not seen by the medical man. Whilst I am sure none of us would affirm, and cannot say, from what you have said, that such infections do not occur in the mouth—(they probably do frequently occur in the mouth, but not always)—our medical friends might, I think, refer many of those cases to us before upsetting the patients by condemning the dentitions. I would like to say how pleased we are to have you with us, and particularly to find how sympathetic you are with our profession.

Dr. Abram said he was not satisfied that streptococcus in the mouth was the cause of pernicious anæmia; there was something else, but he did not know what it was. It raised a very difficult question.

Mr. Livingston: I think we are greatly in debted to the Vice-Chancellor for his extremely lucid exposition of sub-infection. There are many of us here to-night fresh from the schools and supposed to know the last word about sub-infection, but Dr. Adami has told us things we have not heard or thought about before. We do not find these things in the ordinary text-books, and yet they are of such vital importance. Mr. Livingston asked Dr. Adami a question which raised the point as to the value of X-ray diagnosis.

Mr. E. Harrison: I would like to add my word of appreciation for Dr. Adami's address. His presence here to-night indicates his interest in our profession, and that is a thing which is not too common with the dental and medical professions of the present day. We are very pleased to be recognized as an efficient branch of the medical profession if you like, and to that extent we are indebted to Dr. Adami more than ever for the lucid lecture he has given us on his own special subject. We would wish to evince to him the cordiality of our appreciation for coming here and showing us that he is interested in our work. We as dentists ought to know some little about the mouth, and we are pleased to recognize from Dr. Adami's lecture to-night, and from his presence amongst us, that we are becoming increasingly useful to the medical profession in helping them to give the public perfect health. I ask you formally to accord a very hearty vote of thanks to the Vice-Chancellor.

The vote of thanks was enthusiastically passed.

THE PRESIDENT: Just before calling on Dr. Adami to reply it might interest him to know that in actual practice amongst the poorer classes, after extractions have been performed and the patient comes back in perhaps two or three months' time for artificial teeth, there is a change from an anæmic condition to one of apparently perfect health. It is absolutely impossible not to connect the absence of the unhealthy mouth with the changed condition of the patient. That has not happened in an odd case, but has been repeated time after time.

DR. ADAMI: I thank you for this keen discussion. Regarding X-rays, it semes to me that in these days, certainly after one's experiences at the front, there is only the very expert man who can properly read X-ray plates. There is far too much to-day of junior and apprentice reading of those plates, because so constantly one comes across mal-readings, imperfect readings, that I welcome with extreme pleasure the work that has been started at Cambridge, in recognizing that the X-ray practitioner must have had a thorough training and must get a diploma. I would like to see them starting a diploma in Liverpool. It is such expert work. I feel that we are on the right lines as to finding an explanation of many cases of chronic disease. We must not go to the extreme of putting everything down to the mouth that we cannot ascertain by any other means; that would be wrong.

The proceedings then terminated.

Toronto Dental Society

THE opening meeting of The Toronto Dental Society is to be one of unusual interest, at which Dr. Gysi will deliver an address upon the subject of "Some Essentials to Masticating Efficiency in Artificial Dentures."

The meeting is to be held on the evening of Friday, the 1st of October, 1920, at 8 P.M., in the large Lecture Hall of the Royal College of Dental Surgeons, Toronto.

Out of town Dentists are cordially invited to attend this meeting as the guests of the Society.

W. H. COON,
President.

H. H. ARMSTRONG,
Secretary.

POTASSIUM SULPHATE IN DEFINITE PROPORTIONS.

In the January Summary, Dr. D. D. Campbell gives a method of using potassium sulphate to hasten the setting of plaster; I find a far better method is to use a stock solution composed of sulphate of potassium, 30 grammes; water q. s. ad. 1000 cc.

This solution is used full strength for mixing the impression plaster and in this manner uniform results always follow. A given quantity of solution and a corresponding amount of plaster will set in a fixed number of minutes. Dr. Jas. Quintere, Lyons, France.—(*Dental Summary.*)

A Bit of Sacrilege

FOR years there has been a certain tree by the roadside which was so very beautiful and symmetrical that I made it a point of journeying to see it each season. I was so absorbingly interested in it that I wrote several articles about it, and published its picture more than once. I grew to calling it "my tree," because it had appealed to me more than any other tree I had ever seen—and all trees appeal to me very strongly. It was so perfect in form, and the foliage was so dense and vigorous that it was a joy to watch it.

Somehow it seemed more *alive* than other trees. It stood with no ulterior influence to mar the beauty of its contour, or the vigor of its growth. It was one of those exceptional works which nature in her lavish mood turns out in such wondrous perfection. I have never been able—try as I would—to adequately describe this tree, but I have had an endless source of enjoyment in visiting it each year, as also have others whom I have taken to see it. I prided myself that I could invariably elicit an ejaculation of surprise and delight from those who beheld it for the first time, and this was rare entertainment for me.

During the past summer I journeyed to the favorite tree as usual, filled with the most delightful anticipation, in contemplation of this wondrous work of nature. What was my horror, my dismay, my genuine grief to find, as the automobile neared the spot, that there was no longer any tree there! Some defiler of things divine had wrought his nefarious mischief upon it. The silent evidence lay there in the mutilated stump, and the vacant glare of the atmosphere. For quite half a century this beautiful tree had sung its song and scattered its shadows for the entertainment of bird and beast and man. Now in one brief moment it was sacrificed in the most shameful ruthlessness, with doubtless never a thought on the part of the fiend who did it of the crime he was committing. The reason for murdering this glorious tree was manifest in the existence of some naked metallic telephone wires along where the tree had stood. *O tempora! O mores!*

Such senseless desecration I have seldom beheld, and I can only hope that the author of it is still unconscious of the enormity of his crime. I sometimes wonder if there is to be nothing left in this world except that which may contribute to commerce or trade. Must we measure the salvation or destruction of a thing merely by the dollars into which it may be translated? Is the love of beauty to be wholly sacrificed to the god of Mammon? Is the age becoming so materialistic that sentiment is being forced out of the hearts of men? Is the love of nature so hollow and negative that it is to be swept aside by a wave of the hand whenever it is supposed to encroach on the domain of utility? I sometimes wonder.

Everywhere I go I see the same utter disregard of the beautiful and the pure. On this same trip I passed the place where I was born, and was compelled to gaze on a blank space beside the gate where two beautiful trees had stood. I was told, forsooth, that they shaded the ground, and prevented the full yield of the land! Bah! I am compelled to wonder if the man who did it is any the richer to-day because of his desecration. And even if he is—even if he has a few more paltry dollars in his pocket, does he get the same rare pleasure from hearing them jingle that he would to listen to the heavenly anthem played by those glorious old trees of a summer eve?

If this thing continues I am going to find myself out of tune with the temper of the age. And yet I must not be too critical—I must remember environment. Let those who cut and slash at trees in this unworthy way be housed for years between walls of stone and brick and mortar, and be obliged always to walk on the hardest cement, and listen constantly to the clamor of city noises—every one of which is harsh and artificial—let them live in this din of struggling humanity and listen to sounds which offend the ear, and see sights which break the heart, and I venture that they would be cured of their mania for destroying the beautiful and the pure in nature. It is, I suppose, largely a point of view. And yet—and yet—I cannot reconcile myself to the slaughter of those beautiful trees; and I never will, in my heart of hearts, forgive the man who did it. The act was too monstrous to be entitled to forgiveness. I am heart broken.

C. N. Johnson

THE COMPENDIUM

This Department is Edited by
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A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

PULPLESS TEETH—SHOULD THEY BE EXTRACTED?

IN these days of radicalism dentistry cannot boast of freedom from those elements which glory in drastic and revolutionary methods of practice. In some quarters moderation is considered old fashioned and as such must needs be discarded. Everything new, destruction for old theories and practices, however satisfactory they may have been—this, we sometimes are forced to believe, is the basis of our new teaching. As an illustration of this tendency we have those who advocate and practise the extraction of every tooth in which pulp treatment is involved.

Many dentists are now coming to the conclusion that such practice is too radical and that the results obtained do not warrant its continuance. Others still cling to the belief that the early removal of all teeth in which pulp treatment of any sort whatsoever is required, is necessary if the patient's health is to be properly safeguarded. That there should be such divergence of opinion on such an important question shows that our investigations have been incomplete and hurried, otherwise a finality of opinion would have been established one way or another. The present status of the subject is not flattering to our profession. Our patients suffer the needless loss of teeth, perhaps, and we are undecided as to the right thing to do. Unquestionably this is the biggest problem facing the medical and dental profession to-day.

The International Journal of Orthodontia in its June issue takes up, in a very able manner, the defence of the pulpless tooth. It is pointed out that the advocates of extraction have, as a rule, in their enthusiasm to establish a case, set aside evidence that could be produced in favor of retaining pulpless teeth, and the only evidence considered was the "case reports" of a certain number of patients in whom it was supposed that systemic infection could be traced to pulpless teeth with infection at the ends of the roots. While it is true that some patients with systemic infections have improved after the removal of the pulpless teeth, it is also equally true that a large percentage of systemic infections did not improve. Many cases of rheumatic tendency, arthritis, etc., have improved after the pulpless teeth are extracted, but this does not prove that the infection from the tooth was the only infection in the body related to these disorders. There may be many other sources of infection. Very often when this improvement occurs, it is the result of the "change of balance" between the number of micro-organisms in the system of the individual and the number of micro-organisms which the leucocytes in the system can take care of. Improvement at the time, or shortly after, only proves one of two things. First, by the removal of the teeth some of the sources of infection in the body have been eliminated, which changes the "balance" for a certain period of time. Second, by the removal of the teeth some of the blood vessels in the immediate area of infection have been opened and some of the germs which were present around the tooth have gained entrance into the blood stream and have produced a change therein similar to bacterial vaccine, and consequently increased the action of the leucocytes for a period. After the removal of a pulpless tooth it is very often observed that the individual has a rise of temperature, increased pulse, which is generally caused by germs entering the blood stream and which act upon the blood contents in a beneficial manner. After the recovery of the first shock from the extraction and the rise in temperature, the individual immediately improves. Such a condition proves only that the tooth infection may have been only one of the causes, because it is generally observed that such an improved condition is not permanent. Herein lies the disappointment which follows extensive extractions.

Most of us are apt to look for greatly improved conditions in rheumatic cases where the pulpless teeth have been suspected as the inciting cause, and have been extracted. In the editorial of The International Journal it is pointed out that there may be infection anywhere in the alimentary tract, in the liver, the gall bladder, kidneys, fallopian tubes, prostate glands, or any other part of the anatomy. It is also to be remembered that a great many more rheumatic conditions associated with systemic disturbances are the result of gonorrhea, than are caused by pulpless teeth. It is just possible that the infection at the root of a tooth may be in some cases secondary, the initial infection being in the tonsils or other organs. This has yet to be investigated.

Even if germs are found in the granulama at the root of a tooth, it is, in the editor's opinion, no positive evidence that the granulama is the cause of the systemic infection in the individual. Tubercule bacilli may be found in the lungs of many individuals who are not suffering from tuberculosis. The advocate of extraction says that if the germ is found in the granulama the tooth should be removed as a prophylactic measure. In view of the fact that every organ of the body is subject to infection at all times, subject to the invasion of micro-organisms which are eliminated in course of time, his contention if applied generally would mean that any organ of the body, if infected, must be removed. The results would prove rather disastrous.

One of the most serious aspects of this extraction epidemic is that many operators are not satisfied with the complete extraction of the offending teeth, but insist upon their removal surgically, which means that a considerable portion of the alveolar process comes away too; this is for the purpose of getting rid of all possible infection. For such cases it becomes an exceedingly difficult task to make an artificial restoration.

The opposition to the present radical policy regarding pulpless teeth is not confined to this country alone. Away from Australia comes a plea for the early reconsideration of the whole problem. In the June issue of The Commonwealth Dental Review, the editor expresses regret that hysteria should have taken the place of common sense. He says: "How a new doctrine of this kind (the extraction of all pulpless teeth) can suddenly impress itself so forcibly upon dentists far and wide that they find themselves preaching it to their patients and putting it into practice on every occasion, is somewhat difficult to understand. It is possible that dentists are being too largely influenced by medical men in this matter."

If we could but arouse the interest of some of our best thinkers, who by the way are seldom heard from either from the platform or press, we could very speedily destroy the present policy of "Extraction without discussion."

OBTAINING RELATION OF SADDLE TO CLASP.

By A. W. Lufkin in Pacific Dental Gazette.

IT is known that a cast gold saddle will not go to place perfectly over a model of the case. Therefore, in a piece of work involving the use of gold saddles, the surest way to success is to obtain the relationship of the saddle to the clasp or attachment under light pressure directly in the mouth. Satisfactory results may be obtained as follows: Build a modelling compound block upon the saddle to a point slightly above the occlusal plane, allowing the compound to flow around the tooth carrying the attachment. Chill, and remove, slightly warm the occlusal surface of the compound over the flame and place quickly in hot water. Insert in the proper position in the mouth and allow the patient to close until the opposing teeth are indented in the compound. This will equalize the pressure on the saddle. Remove and relieve the compound generously around the tooth that is to carry the attachments. Set the attachment in place. Fill in biting block with soft plaster where the compound has been cut away. Place the saddle in position and allow patient to exert slight pressure until the plaster is set. Generally when the impression is removed the attachment will come with it, but if it should resist and become dislodged it can be easily replaced in correct position to the biting block. Pour a model of some investing material and solder the attachments to the saddle upon this. This method may be used in assembling two saddles at the same time as in a lower case where we are desirous of obtaining the relationship between the saddles and clasps.

SLEEP—A REPORT IN THE COMMONWEALTH DENTAL RECORD VOL. XVII. NO. 5, FROM THE MEDICAL JOURNAL OF AUSTRALIA.

IN an address delivered before the Dublin University Biological Association on the above subject, Mr. E. H. Allen makes some interesting observations.

Man spends about one-third of his life in sleep, which is a period of anabolism, repair and growth, during which the organism fits itself for renewed activity. In the first place, metabolism is slowed but not arrested. The amount of oxygen consumed is diminished and the quantity of carbon dioxide produced and removed is reduced. Many physiologists have endeavored to ascertain the nature of the change in the distribution of the blood when a person passes into a condition of sleep. Measurements by Mosso's plethysmograph tend to reveal that the limbs enlarge in response to a dilation of the peripheral vessels. Circulation in the brain is slowed and restricted, with a consequent diminution in the size and weight of this organ. Some sixty years ago Durham proved that sleep is accompanied by cerebral anaemia. The blood pressure is said to fall during the first two hours of sleep and then to rise gradually until the person awakes. Similarly there is evidence of a reduction of tissue metabolism in the internal organs, following a lessened blood supply and a slower rate of movement of blood in the vessels. It is, however, well known that digestion continues during sleep. The renal excretion is at times as active during sleep as during waking, although this is not the rule. The sweat glands in the skin reveal increased activity owing to the hyperaemia of the cutaneous regions of the body. It may, therefore, be concluded that sleep is not actually a period of anabolism, but of modified metabolism. That tissue repair proceeds during sleep is highly probable, although direct observations are wanting. Growth apparently continues at its normal rate during waking, although there is some evidence that it is accelerated during periods of prolonged resting.

It is agreed that reflex nervous excitability is weakened during quiet sleep. Usually the voluntary muscles are relaxed, but normal muscular activity may be exhibited during sleep. External stimuli produce a normal or perhaps lessened response. Dreams indicate cerebral activity with the possibility of normal associations. Purkinje has suggested that sleep is due to the cutting off of nerve paths between the brain and the periphery by a cerebral congestion. There seems little evidence to substantiate this. Osborne postulated in increased secretion of cerebro-spinal fluid from the arachnoid plexus and a consequent distension of the ventricles. Information concerning the changes in the central nervous system during sleep is very incomplete. Many theories have been advanced concerning the mechanism governing the removal of consciousness, among which are the vaso-nator and chemical theories, but none seem to satisfy. The physiology of sleep remains an unsolved problem.

British Columbia and School Dentistry

THE "Public Schools Act" of the Province of British Columbia has been amended covering the provisions for Dental treatment of school children.

Section 45 of Chapter 206 was amended by adding to the said Section the following clause and sub-section:

"(1.) To provide, if deemed advisable by the Board, for the examination of teeth of all children attending school in the district, and, subject to the consent of the parents or guardians of the children, for the surgical treatment of the teeth of such children; and for such purposes to employ and pay duly registered dental surgeons and such nurses, and to provide such buildings, furniture, equipment, fittings, instruments, machinery, and materials as may be necessary; and for such purposes to make all necessary regulations, including regulations for the fixing and collection of fees from parents and guardians for surgical treatment provided in cases where collection of fees is deemed advisable;

"(2.) All expenses incurred by the Board under the powers contained in this section for the purposes of the examination and surgical treatment of the teeth of children attending school shall be deemed to be ordinary expenses of the Board for the current year, and all fees collected for surgical treatment provided shall be paid to the municipal treasurer, who shall receive and apply the same to the purposes specified in this section."

An amendment was also made providing that such treatment may be extended to persons in the district over sixteen years of age, should the Board deem such course advisable.

MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

THE OIL-STONE.—As a lubricant, use one part glycerin and two parts alcohol. This will keep the surface clean and sharp-gritted. Oil gums up the stone.—(H. W. S.)

THE CARE OF CREOSOTE.—To retain the full strength and medicinal qualities of creosote, it must be kept in a bottle of white glass, sealed with a glass stopper annd placed where it may receive the light of the sun. If kept in a dark-colored bottle, hidden away from daylight, it deteriorates.—(B. J. C.)

MOUTH-BREATHING.—Mouth-breathing may be largely counteracted by the development of the muscles of mastication, which in the time of sleep will keep the jaws closed, while weak muscles, which are never used in mastication, constantly relax during sleep, and the mouth is bound to drop open.—(F. B. N.)

SIX CONDITIONS ESSENTIAL TO THE IDEAL OPERATING ROOM.—First—Proper ventilation. Second—Abundance of sunlight. Third—Modern heating arrangements. Fourth—Sanitary plumbing. Fifth—Correct exposure. Sixth—Proper lighting facilities. —(*Dental Summary.*)

BEFORE TAKING IMPRESSIONS.—Examine the jaw and make a thorough diagnosis. Examine the posterior third for soft and moveable tissue, indicating whether displacement of tissues is necessary or not. Examine the buccal and labial sides of the jaw for muscle attachment—whether the muscles are strong and firm, or weak and covered with a soft, sub-mucous tissue. Pay special attention to the vault for hard areas and for spicule of bone, which can only be felt under pressure with the finger. Also examine for soft, flabby ridges. —G. P. Brenner, D.D.S. "*Journal of the N.D.A.*" (*Dental Review.*)

A Good Silex Investment.—A good smooth investment material for inlay work and the coating of any wax pattern may be made as follows: Take three pounds of the best powdered silex you can obtain, one pound of Kerr's white model plaster and four ounces of Venetian red; mix them thoroughly by sifting through a flour sifter. When the color has become uniform the mix will be satisfactory.—F. W. F., *Pacific Dental Gazette.*

A Cure for Toothache.—Two men were walking together when one suddenly complained of a toothache. Eventually they found themselves in front of a chemist's shop, whereupon the afflicted one asked his friend what he would advise him to buy. "Why," said the other, "the last time I had the toothache, I went home and my wife kissed it away for me." After a moment's pause the sufferer said, "Is your wife at home now?"—(*Dental Review*).

Systemic Relation of Oral Cavity.—Although the principal field of action of the operative dentist is the Oral cavity, it is necessary for one who aspires to succeed to any great degree, in this particular branch of a noble and elevated profession, to become, at the beginning, deeply imbued with an all-important, ever-pervading truth. And that truth is this: the oral cavity is intimately and closely associated with all other parts of the body, by way of the nervous, vascular and lymphatic systems.—(*Dental Summary.*)

Average Age at Death of Dentists.—The lowest death-rate in any vocation is said to be that found in the ranks of clergymen, the average age of death in this profession being quoted as about sixty-eight years. The variations in the average ages at death of the different callings in life run from sixty-eight to forty-three, and the death rate of dentists is given at forty-five. This mortality rate is about on an average with that noticed in people who live lives of excessive work, either mental or physical, and especially if the complication is added of an occupation requiring a cramped and constrained position. The very nature of a dentist's calling necessitates an indoor life, and every effort should be made by practitioners in dentistry to make a decided endeavor to cultivate those obvious methods of life which tend to counteract the deleterious effects of the severe labor and appreciable exhaustion incident to the arduous nature of a dentist's daily work.—*Medical Press per Dental Surgeon.*

A Time Saver for Carmichael Wax Patterns.—Case in hand: Upper right cuspid. After cavity is prepared take gingival measurement and make a soldered matrix, tubular in form, with gingival portion slightly greater in diameter than the incisal portion.

Having contoured the gingival part on, oil the inside of the tube slightly with colourless paraffin oil, and fill the tube with inlay wax heated to the proper temperature. With thumb, force the tube filled with wax over the tooth in the correct position, allowing the excess wax to flow out slightly at the gingival, but mostly at the incisal; chill well and remove them from the tooth. Push wax pattern out of tube with end of orange wood stick or instrument, and replace pattern in cavity, trim to contour and burnish, insert sprue in mouth, remove pattern and invert, and proceed as for any gold inlay. This technique may be used with either the direct or indirect method, but saves considerable time for the direct method.—*Pacific Dental Gazette.*

TREATMENT OF ACUTE SEPTIC GINGIVITIS (VINCENT'S DISEASE.)—As one sees nowadays so many cases of this disease, I should like to suggest a simple treatment which I have found most effective. After the usual routine treatment of antiseptic mouth wash iodin, scaling and removing of septic roots, I instruct the patient to have the gums syringed two or three times a day with potassium permanganate solution (1:5000); the color of pink blotting paper is quite enough guide as to the strength of the solution. A 4-oz. glass or an ear syringe with a fine nozzle may be used, the essential part of the syringing being to use a good deal of force. Have the syringe about one foot away from the patient's mouth, and freely syringe all affected parts; this washes away the pus, sloughs and grayish membrane from the gums and between the teeth. The patient will always find some one at home to do this syringing for him. This treatment makes a wonderful improvement even in two or three days; the painful condition of the gums ceases, foul odor of the breath disappears, and the gums take on a healthy appearance. The reasons for this rapid improvement are:

(1) The organisms which cause this condition, fusiform bacilli and spirochaetes, are easily washed out if enough force is used in syringing.

(2) Those organisms that are left are killed by the oxygen from the potassium permanganate frequently used, as these germs are anaerobic, and also will not flourish in the absence of necrosed tissue.

(3) The force of the syringing acts as a gum stimulant, and the blood supply is increased.

I have practised the above treatment now for the last four years with good results, in England and abroad. One finds more cases of this kind in the tropics than in England, but lately they seem to be increasing here.—*Albert B. Crocker, British Dental Journal.*

ORAL HEALTH

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Vol. X. TORONTO, SEPTEMBER, 1920 No. 9

EDITORIAL

Temperance Enactments and Dental Practitioners

ALL provincial temperance enactments make provision for dental practitioners to secure from time to time such liquor as may be necessary for *bona fide* use in the practise of dental surgery. Every member of the dental profession is urged to loyally co-operate with the various License Boards, and honorably carry out the regulations which have been adopted that dentists may obtain necessary supplies of liquor without undue trouble or expense.

In the Province of Ontario the Government's attitude toward dental practitioners was recently shown by an amendment enabling the dentist to have in his possession one quart of liquor, in place of six ounces as formerly. This amendment enables dentists to obtain liquor in original packages from Government vendors rather than in smaller quantities from local druggists. Questions both of quality and expense were involved, and doubtless the profession generally will appreciate the Government's attitude in this matter. However, it is sincerely to be hoped that no dentist will misinterpret this action upon the part of the Government. There still remain the same moral and legal obligations to carry out both the spirit and letter of the law in a manner worthy of the good name of the profession. Individual dentists will surely realize that any breach of this trust will react upon the whole profession to the detriment of both themselves and their confreres. Already cases of suspension by the Ontario License Board have occurred.

In the administration of the Act a peculiar situation has arisen in relation to the four districts of Manitoulin Island, Peel, Huron and Perth. These counties come under the Canada Temperance Act, and are not entitled to secure liquor from Government vendors established under the Ontario Temperance Act. In these four counties it is possible to have liquor shipped in from outside the province for family or personal use, and for professional purposes it may be secured in 10 ounce quantities upon certificate, vouched for by two justices of the peace, and then honored by local druggists. In all the other counties of the province the provisions of the Ontario Temperance Act apply.

Canadian Army Dental Corps

AT the recent meeting of The Canadian Dental Association, in the City of Ottawa, the question of the future organization and administration of the Canadian Army Dental Corps was discussed, and a committee appointed to take up this matter and report to the next meeting of The Canadian Dental Association.

After very thorough discussion of the whole question, the following resolution was adopted and presented to the Government:

That in the interest of the public a permanent Army Dental Corps as an independent unit, be authorized in Canada for the following reasons:

1. That efficient dental service for the permanent and Militia forces of Canada, demands such a corps.

2. That a definite promise was given to the dentists of Canada, by the then Minister of Militia, that such a unit would be established and that failure to establish such a corps would be regarded as a breach of faith.

3. That the establishment of such a unit would insure the cooperation of the best men in the profession.

4. That the important part played by dentistry in the recent war and the efficient services rendered by the Canadian Army Dental Corps, justify the dental profession in making such a request.

Thanksgiving

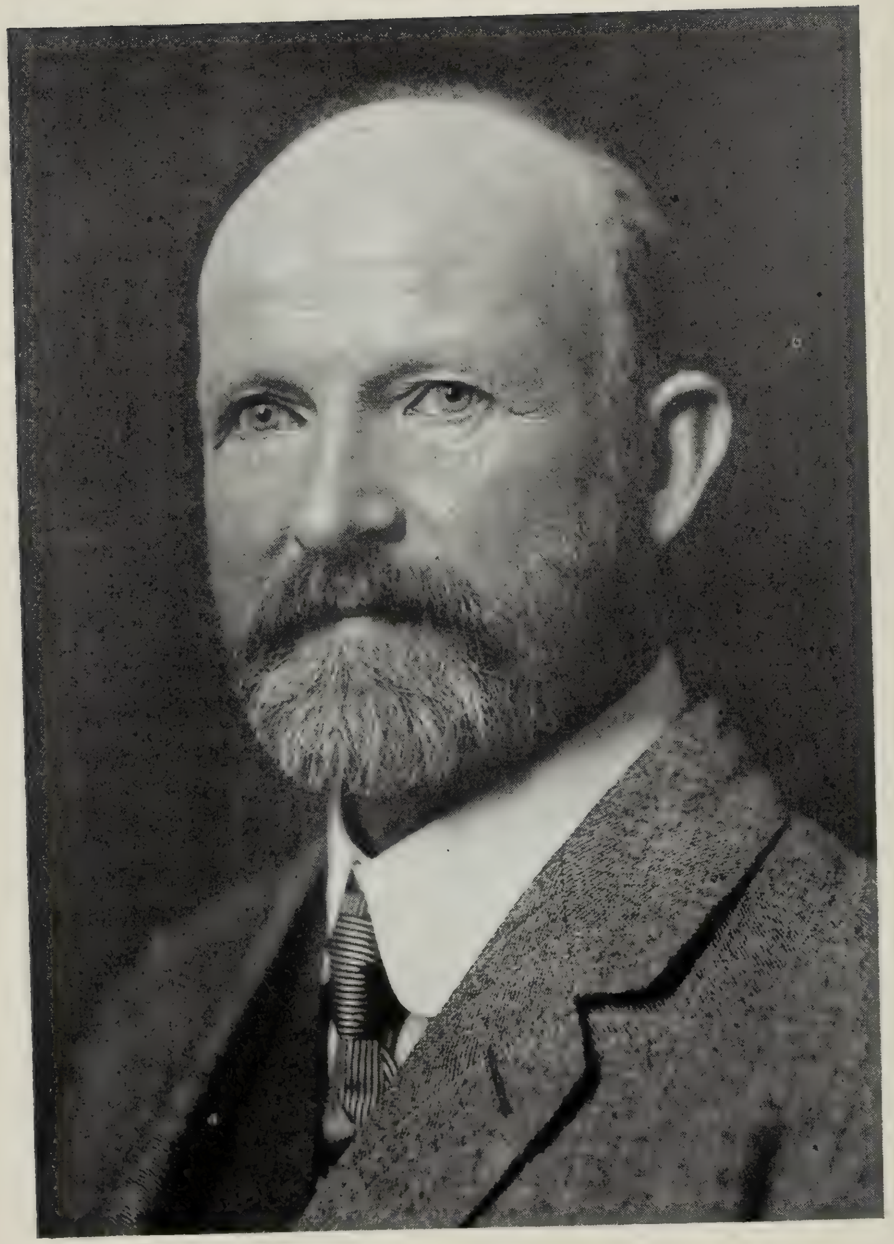
"WE thank Thee for the Sunshine and the Rain; for Love, Hope, Health and Freedom; for the Friends who understand and for those who call themselves our Enemies but who are, in fact, our friends who do not understand, for both encourage us to greater and better endeavors.

"We thank Thee for the happy Yesterday and for the happier Morrow; for the Blessings Thou hast bestowed upon us and ours and upon our friends and theirs.

"We thank Thee for the Opportunities offered us to serve; for your Guidance in all our ways and deeds.

"Bless us, if it may be, in all our Endeavors; teach us to brighten Grief, help us to bring Smiles where there are Tears and to plant Cheerfulness into sorrowing hearts. Bless our friends and the friendship with which they have endeared us, for friendship is the true measure of men.

"May this day and all the days to follow be days of Thanksgiving in Thy sight."



Alfred Gysi, D.D.S.,
Zurich, Switzerland.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, OCTOBER, 1920 No. 10

Some Essentials to Masticating Efficiency in Artificial Dentures*

ALFRED GYSI, D.D.S., ZURICH, SWITZERLAND.

Mr. Chairman and Gentlemen:

I AM greatly pleased at this opportunity of making your acquaintance and of appearing before you, and I feel greatly honored that so many of you should have given the evening, and perhaps have gone to no small amount of trouble, to hear what may be said on some of the underlying phases of denture construction.

You will readily understand that the time at my disposal is so short that I cannot fully cover the title of my paper. I cannot condense the results of thirty years of study into thirty minutes of speech and do justice to you and myself. I am sure you will excuse me if I make no reference to some of the most important elements of masticating efficiency in artificial dentures, such as the technic of taking impressions and bites. The technic in these procedures has been highly developed by American workers, and on these subjects you need nothing from me. I shall keep you quite long enough if I discuss some of the simpler aspects of studies upon which I have long been engaged and which have an important influence upon certain phases of denture construction.

I wish that I might bring you the message that these studies have discovered some way of making denture work so simple and easy that it could be undertaken without special studies and effected without minute attention to detail. Unhappily I cannot do this. In fact, my belief is just the opposite. While it is not difficult to succeed in denture work for average cases, I believe that success in abnormal cases requires a high order of intelligence and close attention to detail. I am, therefore, going to talk to you for a while about average and abnormal denture movements of the mandible, upon the importance of their recognition by the dentist and their influence upon the course of denture construction.

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*Read before the Toronto Dental Society, Friday, 1st October, 1920, and published in Oral Health by courtesy of The Dental Digest.

NORMAL MOVEMENTS OF THE MANDIBLE IN MASTICATION.

The normal movements of the mandible in mastication may be divided, for purposes of description, into three elementary groups—vertical movements, incising and sidebite. In practice these movements are inseparably combined in many ways to produce the triturating movements by which food is prepared for digestion.

The elements of the movements of the mandible in sidebite cannot be seen by watching a person, because the movements appear to be only up and down. But, if specially designed apparatus is employed to record the movements, it is shown that, starting from the position of central occlusion, the mandible first moves downward and a little laterally, and then moves strongly laterally and a little downward. The mandible returns to central occlusion by moving upward and a little toward the median line until the buccal cusps of the mandibular molars and the maxillary molars are interdigitated, after which it slides upward and inward to the position of central occlusion. The completed movement is shown in slides No. 1 and No. 2.

To perform the incising movement, the mandible moves from the position of central occlusion downward and forward and then upward until the edges of the mandibular incisors are in contact with the edges of the maxillary incisors. It then moves upward and backward, with the teeth in contact, to the position of central occlusion.

A recognition of these elements of the movements of mastication is very important to the dentist in at least three ways:

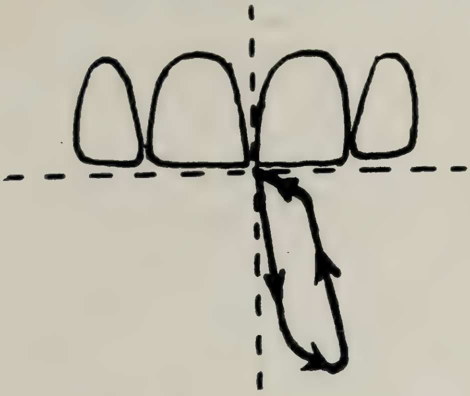
First, he can judge the value of an articulator by the accuracy with which it reproduces these elementary movements.

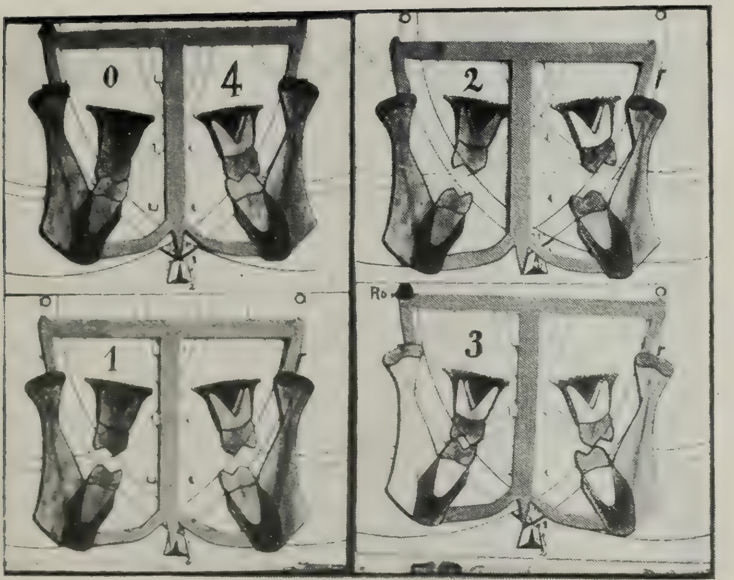
Second, he can judge the value of the different form of artificial teeth by knowing whether or not they are formed to facilitate these movements.

Third, if he arranges artificial teeth for these elementary movements he can readily adapt them to all the combined movements by automatic grinding of the teeth in the mouth.

The purpose of my paper this evening is to show you the nature of these elementary movements, how they may be recorded in the mouth, how they can be reproduced in an articulator, how teeth must be formed by the manufacturer to conform to these movements, and why and how the teeth must be altered by the dentist if they

Slides No. 1 and No. 2.





are to exhibit the maximum of comfort and efficiency in cases where the movements are no longer normal.

STABILITY OF THE DENTURES WHEN THE TEETH ARE SEPARATED.

Before taking up the matters of which I have just spoken, I want to speak of another matter which has caused some confusion in the minds of students of denture technic. It has to do with the stability of the dentures under pressure before the teeth come into contact. Stability of the dentures under these conditions is dependent upon three things, none of which is properly included within the range of this paper. They are:

First, good impressions.

Second, properly fitting plates.

Third, the placing of the molars, at least approximately, in the line of force from the crest of the maxillary ridge to the crest of the mandibular ridge.

The technic in relation to these matters is highly developed in this country, and you need only to follow it to achieve success in this phase of the work.

THE MEANING OF THE TERMS "AVERAGE" AND "ABNORMAL."

Before we can consider how the mandibular movements in mastication may be recorded, an important definition must be established. It has to do with the use of the words "average" and "abnormal." I shall use the word "average" to indicate the average of the mandibular movements recorded by a large number of persons who have all of their teeth present and in fairly good positions. When an edentulous person exhibits similar movements, I shall regard those movements as average.

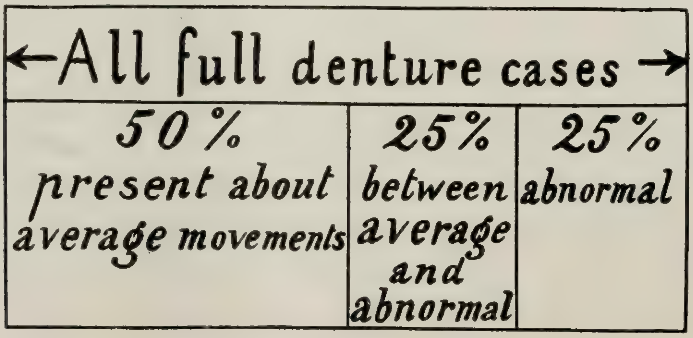
I shall use the word "abnormal" to indicate a sufficiently great departure from the average movements so that technic suited for average cases would not produce satisfactory results.

THE DIFFERENCE BETWEEN OTHER TEACHERS AND MYSELF.

This reference to average and abnormal movements in mastication enables me to set clearly before you the beliefs which have resulted from my years of investigation and the theories which underlie my teaching.

I believe that about fifty per cent. of the persons who present for full dentures exhibit approximately average movements, so that teeth can be satisfactorily arranged for them in any of several anatomical articulators. About twenty-five per cent. additional of all patients present movements nearly enough like average, so that if the teeth are arranged in such an anatomical articulator and then ground in the mouth a fair degree of satisfaction will result.

Slide No. 3.



←All full denture cases→		
50% present about average movements	25% between average and abnormal	25% abnormal

These people represent the border line between average and abnormal movements. For many of them dentures made on any non-adjustable articulator will be only fairly satisfactory, and such cases could be much better served with an adaptable articulator, especially men who have little patience in mastering dentures that do not work well from the beginning.

About twenty-five per cent. of all edentulous patients exhibit mandibular movements which are sufficiently abnormal, so that I believe teeth cannot be properly arranged for them in any non-adjustable articulator.

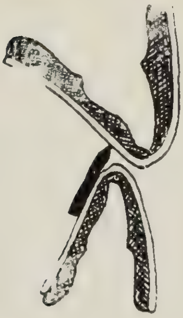
For that half of all edentulous cases which present average movements I do not differ with Doctor Hall and Doctor Monson as to the acceptability of a non-adjustable articulator. But because it is impossible for a dentist to recognize which cases present abnormal movements unless he records and observes the mandibular movements in all cases, or until he fails with the procedure indicated for average cases; and because the recording of the mandibular movements and their reproduction in an adaptable articulator are not difficult, after the technic has been learned, I believe that any dentist who wishes to render a really professional quality of denture service will find the use of an adaptable articulator more satisfactory and economical than the use of any non-adjustable articulator, however satisfactory that may prove for average cases.

RECORDING THE MANDIBULAR MOVEMENTS.

As the purpose of recording the mandibular movements is to enable us to determine what are average movements and to recognize abnormalities, it will be worth while to record the movements of a number of people who have all of their teeth present and in fairly good positions. While the record will be made in such a way as to throw the posterior teeth out of occlusion, they will not be far enough out of occlusion to destroy the habitual movements. And we shall be able to learn what are the habitual movements under these conditions.

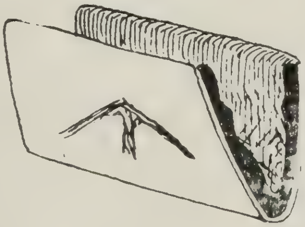
This experiment may be conducted very easily upon your own teeth or upon the teeth of any of your patients. If you will cut two rectangles of thin air chamber metal or heavy tinfoil to be about one inch on the long side and about three-quarters of an inch on the short side, you can easily bend them over the incisal edges of the maxillary and mandibular teeth. Fill the hollows of the little trays with soft modelling compound and press one tray over the mandibular incisors until the metal is in contact with the edges of the teeth. Press the other tray over the incisal edges of the maxillary incisors until the metal is in contact with the teeth. When the compound in the tray over the mandibular incisors is hard, remove the tray from the teeth and affix to the lingual side of the tray a graphite point in such a position that when the tray is upon the teeth the point will be in contact with the lingual surface of the upper tray in the median line. Replace the tray upon the teeth and cause the patient to make incising and sidebite movements.

Slide No. 4.



When the pattern traced by the graphite point upon the lingual side of the maxillary tray is examined, it will be found to look somewhat like that in

Slide No. 5.



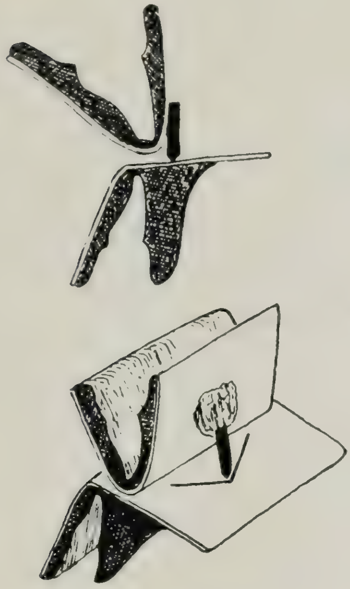
now on the screen. There will be a more or less pointed Gothic arch with its point directed backward, and from the centre of the arch a more or less straight line directed forward.

You will observe that the tray has thrown the posterior teeth out of contact so that the occlusal surfaces of the bicuspids and molars cannot direct mandibular motion. This record, then, presents the habitual movement of the incisor point of that mandible, when not directed by the occlusal surfaces of the teeth. These are the movements which the patient would present if he suddenly became edentulous. They are the movements to which the natural teeth in that mouth are arranged.

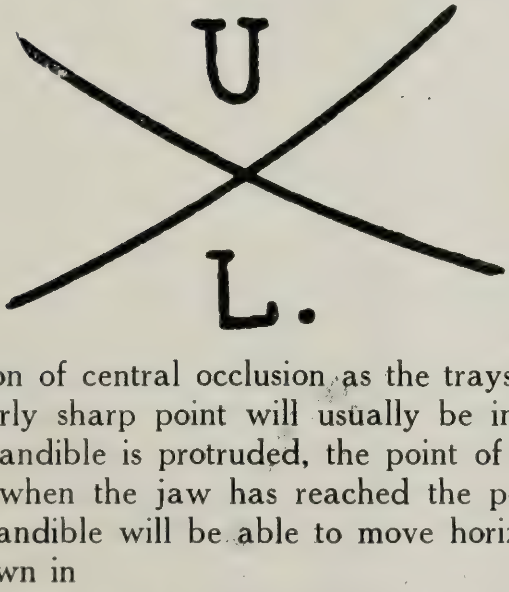
It is not very convenient to watch the tracing of the record when the pencil is upon the mandibular incisors and the record is made upon the maxillary tray, so it will be found more convenient to allow the labial half of the mandibular tray to extend horizontally forward, as is shown in slide No. 6, and to place the graphite point upon the labial surface of the maxillary tray in the median line. The record obtained in this manner will be similar in character, but the point of the Gothic arch will be directed forward—that is, reversed from the record made upon the maxillary tray. If records be taken in both of these ways and combined at their point of intersection, they will appear as in slide No. 7, and will form rather extensive arcs of intersecting circles.

The character of the record will be greatly influenced by any protrusion of the jaw. If the mandible begins its record from as

Slide No. 6.

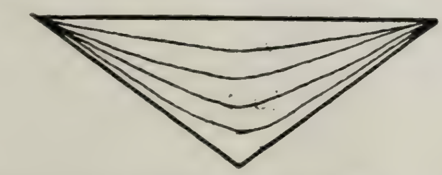


Slide No. 7



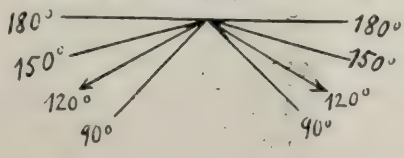
nearly the position of central occlusion as the trays permit, a Gothic arch, with a fairly sharp point will usually be inscribed. In proportion as the mandible is protruded, the point of the arch becomes less sharp, and when the jaw has reached the position of extreme protrusion the mandible will be able to move horizontally from side to side, as is shown in

Slide No. 8. Hold horizontally front.



If a large number of records taken in this way be compared, the results will be somewhat as shown in

Slide No. 9 Hold horizontally front.



The sides of the Gothic arch will, on the average, intersect at an angle of about 120°. A few cases will show an intersection at 90°, but this is sufficient variation from the average to be regarded as abnormal. A few will show an intersection at 150°, but this also is an abnormality. The straight line is very rare except in protrusion of the mandible.

I shall show you presently how records obtained in this way underlie the construction of an anatomical articulator.

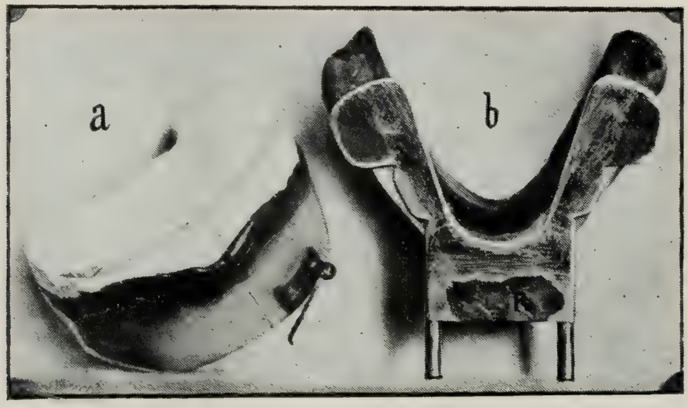
RECORDING MANDIBULAR MOVEMENTS IN EDENTULOUS CASES.

When an edentulous patient presents, the mandibular movements habitual to that patient may be recorded in a manner very similar to that which has just been described, but they may with advantage be made to include records in the molar region as well as at the incisor point.

Well-fitting occlusion rims are made. To the occlusal surface of the mandibular rim is attached the horseshoe plate having wide areas in the incisor and molar regions. These areas are coated with black wax.

To the maxillary trial plate there are attached three movable points which will make records in the incisor and molar areas of the horseshoe plate, as shown in

Slide No. 10.

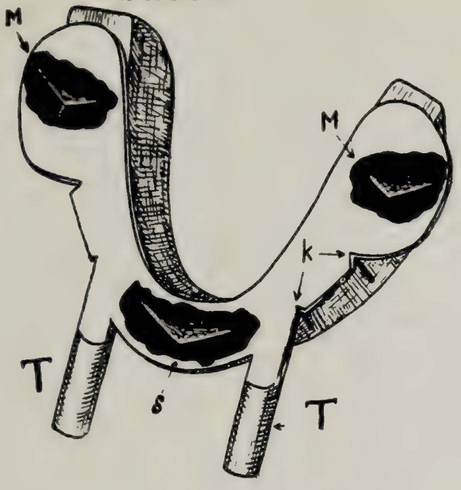


The patient is then caused to make lateral and incising movements with the occlusion rims in contact. If the movements are average in character there will be produced on the blackened areas of the horseshoe plates three Gothic arches, as shown in slide No. 11.

LOCATING CENTRES IN THE OCCLUSAL PLANE.

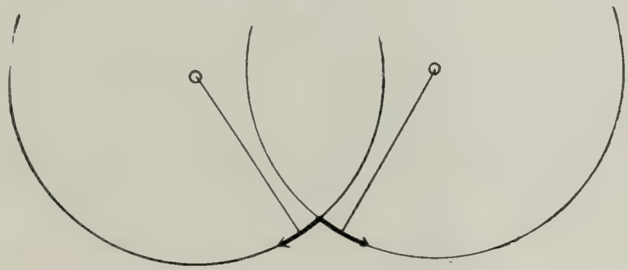
The use which we propose to make of these Gothic arches will carry you back to your school days. You will recall that if you were given an arc of a circle and told to locate the centre you drew

Slide No. 11.



two chords to portions of that arc, and erected perpendiculars at the centres of the chords, as on the left in

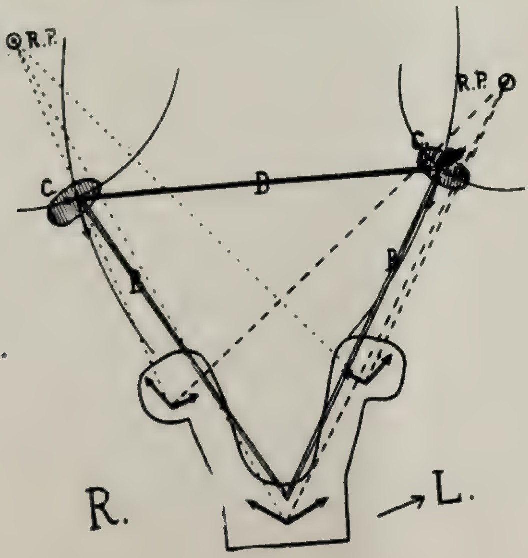
Slide No. 12



If you were given arcs of two intersecting circles, you erected chords to each and found the centres for the two. Out of these centres you could produce both arcs.

If now we fasten the horseshoe plate upon which the records were made upon a flat surface, we can erect perpendiculars to the arcs in the same way that you erected perpendiculars to the chords in your school days. The slide now upon the screen shows, in the form of

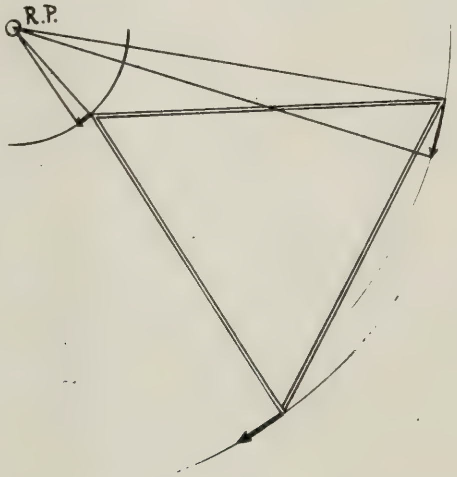
Slide No. 13.



a drawing, the horseshce plate placed upon a flat surface and perpendiculars erected to each of the arcs in each of the Gothic arches. You will notice that the perpendiculars from one set of arcs converge in the upper right corner of the picture, while the perpendiculars from the other set of arcs converge in the upper left corner of the picture. If you place the point of a compass at one of these points of convergence, you can trace from that centre all of the arcs which look in one direction. If you place a compass at the other point of convergence you will be able to trace all the other arcs. In other words, the three arcs looking in the same direction have a common centre. They are what the engineer knows as concentric.

If you place upon this drawing a Bonwill triangle, here shown as BBB, the condyles will be located at the points C, C. Using the points of convergence as centres, you can trace the movements which the condyles are compelled to make in order that the molars and incisors may make the recorded movements.

Slide No. 14.

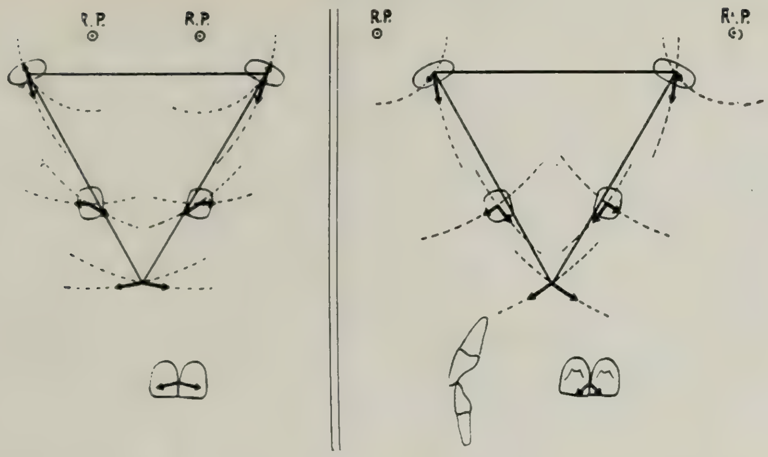


shows the movements of the condyles and the incisor point in one case.

A study of the records of several hundred cases shows the average points of convergence of these perpendiculars to be, on each side of the median line, behind the inter-condyle line. There are, however, many abnormalities of position. I wish to show you a few illustrations of how these abnormalities influence the motion of the mandible and, as I shall show you later, the forms and movements of the teeth. Please bear in mind that we are now discussing movements only in the horizontal plane. Slide No. 15 shows, on the left, the rotation points located between the condyles and nearer the median line than the average positions. They are, however, symmetrical—that is, one rotation point is as far from the median line as is the other. On the right side the illustration shows two rotation points located external to the condyles, but symmetrical.

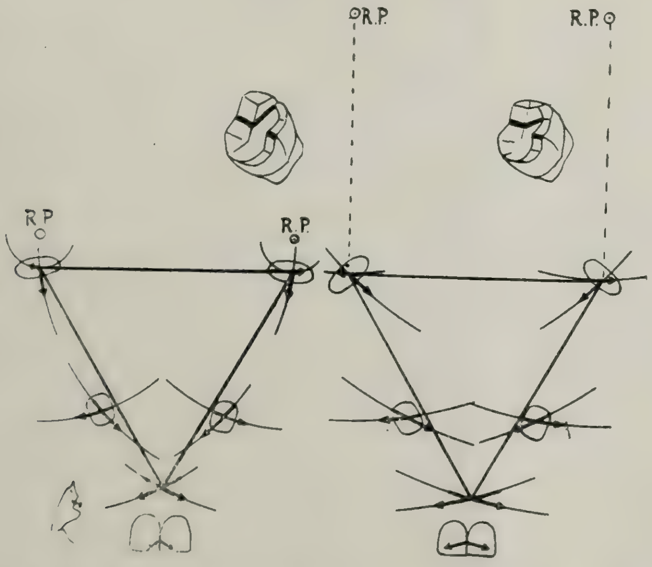
If you will compare the direction of the arcs for the incisor point and a first molar in these two cases, you will see that in the case

Slide No. 15.



where the rotation points are between the condyles the arcs are more nearly horizontal in this drawing—that is, are inclined to each other in a less acute angle than in the case where the rotation points are external to the condyles. If you will examine the drawings of the lingual surfaces of the maxillary incisors at the lower part of the slide you will see two lines presenting the movements of the mandibular incisors in sidebite. You will see that in the one case this movement is much more horizontal than in the other.

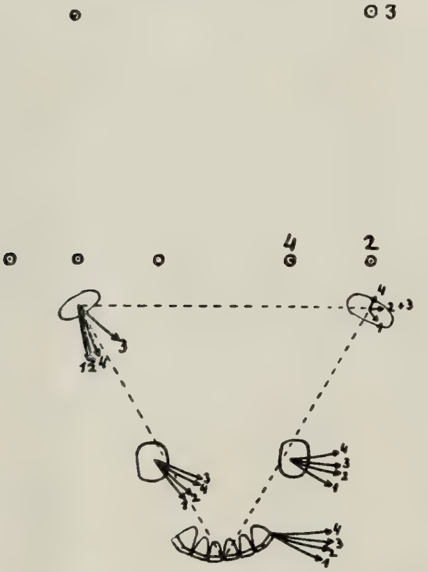
Slide No. 16.



The next slide shows two other abnormalities. On the left you will see that the rotation points are the same distance from the median lines as the condyles, but of normal distance behind the line.

On the right you will see that the rotation points are equidistant from the median line with the condyle, but are very much farther behind the inter-condyle line than in the picture on the left. You will note the difference of direction of the arcs through the first molar and across the lingual surface of the maxillary incisors. You will observe, also, above each of these drawings an outline drawing of a mandibular first molar with a black line across the occlusal surface. This black line produces the arcs which are shown at the location of the first molar below each tooth, and indicates the path of travel of the lingual cusp of the opposing maxillary molar upon the occlusal surface of the mandibular molar. You will see that on the molar in the picture on the right of the slide the path of travel is quite different from that on the molar on the left of the slide. This is the first illustration of a point about which I shall have a good deal to say later, the influence of abnormalities in jaw movements upon the forms of the teeth indicated for the case.

Slide No. 17.



shows four positions of the rotation points and the movements out of these centres of the condyles, the mandibular first molars and the mandibular cuspids which would result therefrom. The movements are numbered to correspond to the numbers of the centres out of which they are made. This slide is the beginning of the evidence I wish to offer in support of the use of an adaptable articulator, because you can see that the sidebite movement out of rotation point No. 1 is quite different, especially at the cuspids, from the sidebite movements out of rotation point No. 4, and that if the teeth were arranged for sidebite movement No. 1 and the patient manifested sidebite movement No. 4, the dentures would be very apt to be dislodged by unrecognized contacts. The dentist who habitually makes records of mandible movements would know whether the patient is making movements similar to the No. 1 here shown or the No. 4 here shown, and can arrange teeth accordingly.

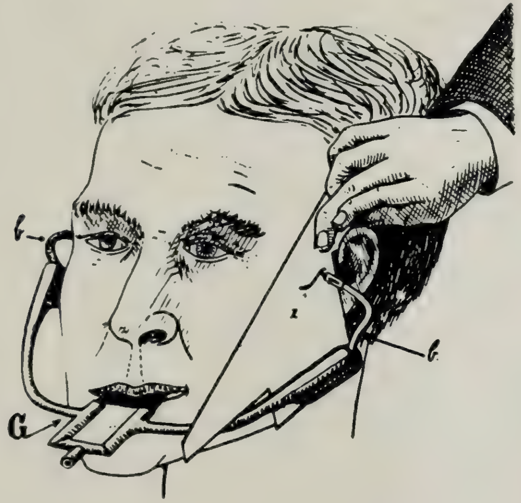
Recording Mandible Movements in the Vertical Plane.

We have been studying the movements of the mandible in the occlusal or horizontal plane, but the mandible does not always move only in this plane. In fact, it cannot make the incising bite or the sidebite without moving somewhat vertically as well as horizontally.

In the same way that we recorded the movements of the mandible in the occlusal plane, we now record the movements in the vertical plane, though the apparatus which is required is somewhat different.

If an apparatus like that shown in be adjusted about the mandibular natural teeth or upon the occlusal surface of the mandibular occlusion rim, the graphite points shown at the ends of the flexible arm b, b, can be adjusted over the heads of the condyles. If a card be held firmly against the side of the face and the patient caused to make opening and sidebite movements, the pencil will trace a black line upon the card somewhat like that shown at Z. This line represents the movement of the condyle over the articulating surface of the eminentia.

Slide No. 18.

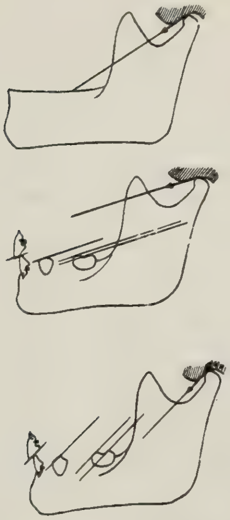


This line will be of different forms in different cases. Sometimes it will be practically a straight line, sometimes it will have two nearly horizontal portions, as here shown, with a sloping portion between. The sloping portion of the line is that with which we are most concerned.

The sloping portion of this line is, on the average, inclined at an angle of about 33° with the occlusal plane. There are many abnormalities, so that the line may, in some cases, be horizontal, and, in other cases, be nearly vertical. Unless the dentist takes the record of the condyle movements in about the manner illustrated it will be very difficult for him to recognize any abnormality in this movement. And this movement is extremely important to the prosthodontist, as I shall now show you. (Slide No. 19.)

This slide shows three diagrams of a mandible upon which have been traced three inclinations of the condyle path. The first inclination

Slide No. 19.



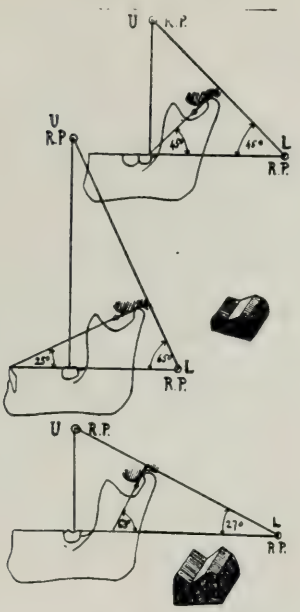
is the average, inclined at an angle of 33° to the occlusal plane. The second inclination is considerably less than average. The third inclination is much more than average. The important point to which I particularly wish to call your attention at this moment is that the inclination of the condyle path greatly influences the inclination of all those facets of the maxillary bicuspids and molars which look backward, and of the mandibular bicuspids and molars which look forward. This relation is indicated by the straight lines drawn through the teeth. It will be noted that in the second figure on this slide, where the condyle paths are inclined less than average, the facets are but little inclined to the occlusal plane, while in the third figure on this slide, where the condyle paths are inclined more than average, the facets are steeply inclined to the occlusal plane. These facets are, of course, important in the articulation of the teeth and especially in the incising bite. These three diagrams show that the inclination of these facets and the consequent height of the cusps is not a matter of opinion, but one which is determined by the average character of the case or the abnormality shown.

The inclination of the condyle path is very important in determining the depth of bite indicated for the artificial teeth for any given case and the form of the longitudinal groove of the occlusal surfaces.

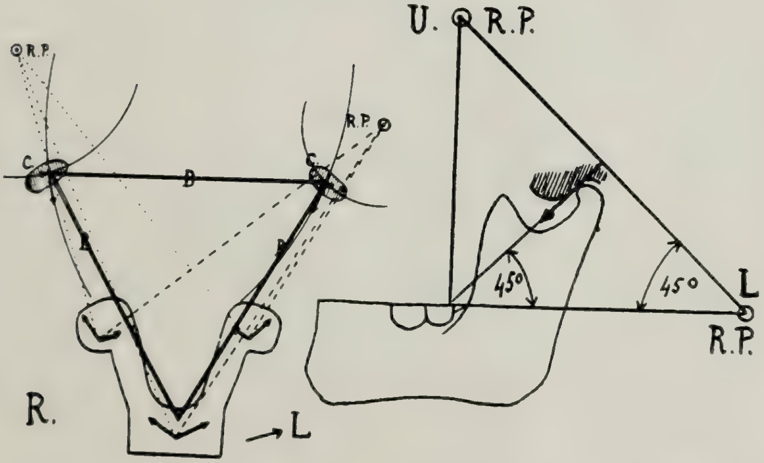
Slide No. 20 shows diagrams of three mandibles with three inclinations of the condyle path. In Fig. 1 of this slide, the condyle path is inclined at 45° to the occlusal plane; in Fig. 2, at only 25°, and in Fig. 3, at 63°.

If we now prolong the occlusal plane backward and locate upon it the rotation point RP, at the intersection of the perpendiculars erected to the records on the horseshoe plate, we can draw through that rotation point, RP, a line which will be perpendicular to the condyle path. If, from the location of the mandibular second molar,

Slide No. 20.



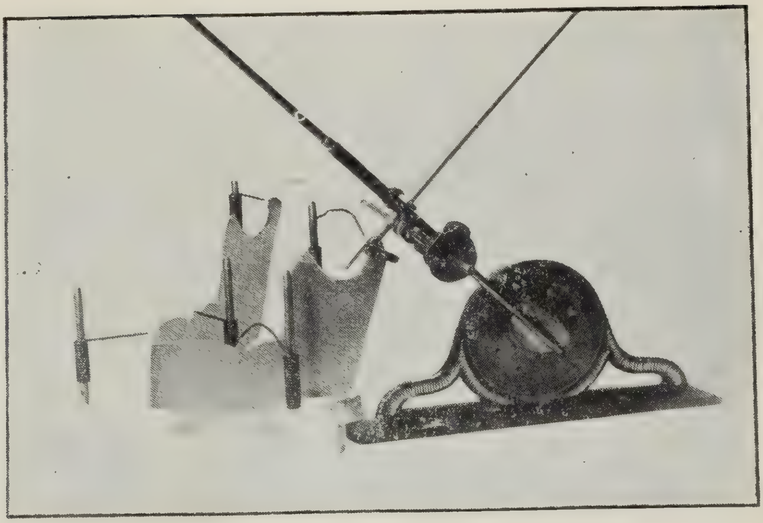
Slide No. 21.

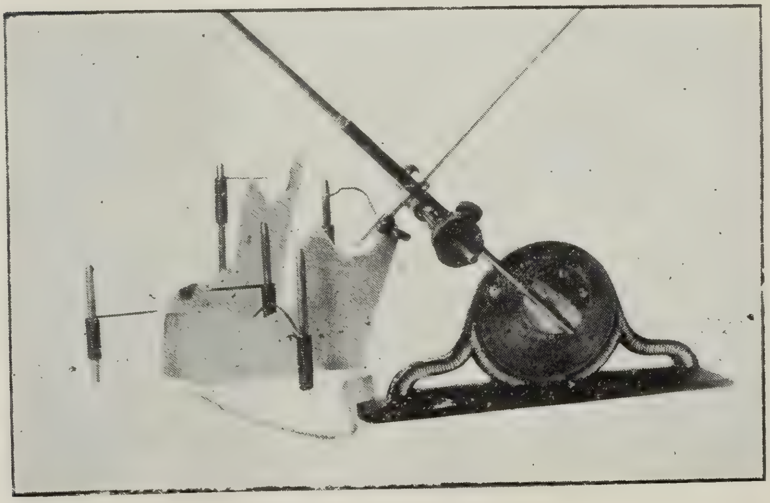


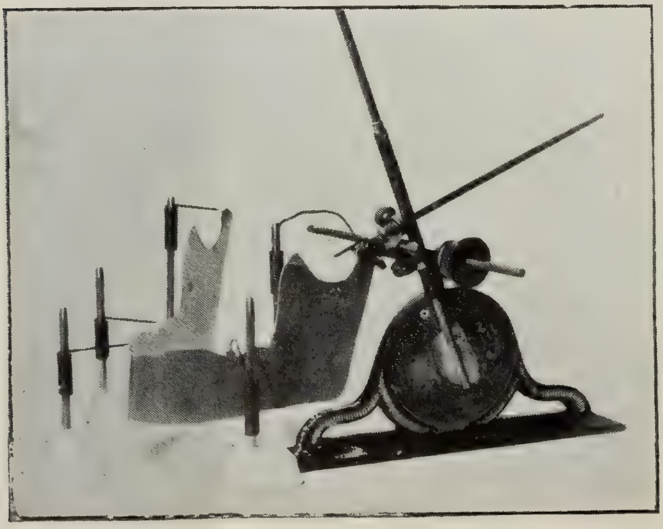
we erect a perpendicular to the occlusal plane, it will cross this line which we have just drawn from the lower rotation point and at right angles to the condyle path at a point which is marked URP, this being the upper rotation point. The line from the upper rotation point to the lower rotation point is the axis about which the mandible turns in sidebite movements.

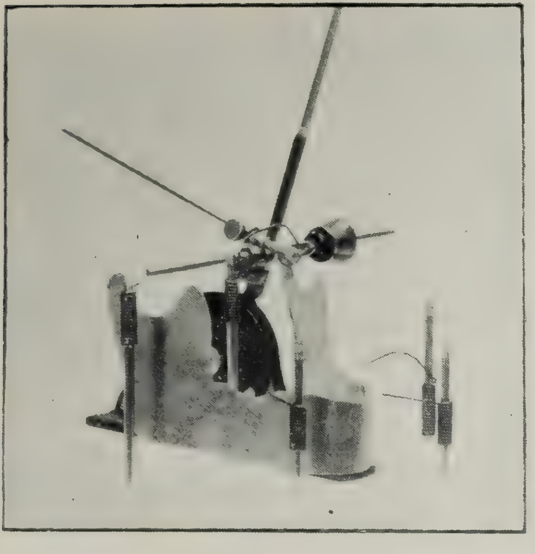
It is easy to show a very important effect of this axis upon the linguo-buccal form of the occlusal surfaces of the teeth. When the condyle path is inclined very slightly to the occlusal plane, as in Fig. 2 of this slide, and the upper rotation point is high above the occlusal plane, the longitudinal groove of the occlusal surfaces will be shallow and the cusps low. When the condyle path is very steeply inclined, as in Fig. 3 of this slide, the longitudinal groove will be deep and the cusps high.

Slides No. 21A, 21B, 21F, 21G.









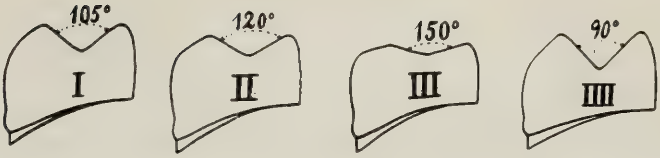
Both of these abnormalities can be produced in the adaptable articulator merely by changing the inclination of the condyle path to correspond to the record taken on the face. Neither of these abnormalities can be produced in any non-adjustable articulator. It follows that while the teeth can be ground very well in the adaptable articulator to conform to these abnormalities, they can not be so ground unless the dentist knows of the existence of the abnormality and its character and degree. He can learn these facts only by recording the mandibular movements for each case.

The inclination of this axis has one very important effect which is but little appreciated. It determines the depth of bite suitable for the case. Doctor Clapp has defined the depth of bite as the distance that the mandibular teeth move vertically during the sidebite, and I accept this definition. The depth which the mandibular teeth will be compelled to move vertically in sidebite movements is determined by the inclination of this axis. When the axis is nearly upright, the teeth will move very little vertically and the bite will be shallow. When the axis is nearly horizontal, the teeth will move through a greater vertical distance and the bite will be deeper. I believe the depth of bite in artificial teeth not to be a matter of arbitrary choice by the dentist, so that he pleases either his preconceived notion or his eye, but to be determined entirely by conditions of the case which the dentist may ascertain if he will make proper records. Shallow bite teeth are clearly indicated for some cases and for these deep bite teeth are contra-indicated. In other cases, deep bite teeth are permissible.

This point is so important that I should like to make it plain. Slide No. 22 presents linguo-buccal cross-sections of four mandibular molars with the degree of opening of the horizontal grooves given over each tooth.

Fig. 1 on this slide shows a cross-section of a molar from the finest

Slide No. 22.



set of unworn natural teeth which I was able to find in the museums of Europe. The longitudinal groove has an opening of 105°, which is the narrowest opening I was able to find.

Fig. III. of this slide shows a mandibular molar with a longitudinal groove opening of 150°, which results only when the teeth are very much worn.

Fig. II. shows a longitudinal groove opening of 120°, which is about the average between these two. The accuracy of my deduction some years ago is shown by the fact that this is now known to be the opening angle for this groove indicated by the average position of the upper rotation point.

Fig. IV. shows a molar with an opening of 90°. This form of opening is purely geometrical, since I have never been able to find a natural tooth with an opening like this. It is now advocated by certain teachers as a means of increasing the triturating power of artificial teeth. They claim great practical successes for teeth of this form, but as this part of the subject is new to me, and I have had no experience with it, I prefer to withhold my opinion.

My experience tends to show that no one depth of bite is indicated for all abnormal cases. Some require less than average depth of bite and others more than the average bite. My solution for this difficulty is to take the record of the patient's movements, to adjust the articulator to reproduce the abnormalities of movement as far as may be, and to grind the teeth to the bite indicated by the abnormalities in the case.

The Depth of Bite in Trubyte Bicuspids and Molars.

At this point I should like to make a little explanation. When I came to America to carve Trubyte bicuspids and molars, I carved three depths of bite, shallow, medium and deep. It was a question which should be produced.

When the unscientific methods in impression taking and bite taking then in general use were considered, and it was recognized that these teeth should be made to be satisfactory in the hands of as many dentists as possible, it was decided to produce the shallow bite, retaining the high cusps and deep fossa. This was done, and the teeth have now been in successful use for some years.

After all these years of experience and study, I believe that depth of bite to be the most satisfactory for at least two-thirds of all edentulous patients. There are cases for which deeper bites are indicated, but I believe that they are comparatively few in number, that they can be recognized only by means of records made as described, and that they should be ground only in the articulator adjusted to reproduce the abnormalities of the case. I heartily agree with Doctor Williams and Doctor House in their statement that whatever may be the abnormalities of a case, deep bite teeth are contra-indicated for all dentists save those who have an exact technic in impression and bite taking and in arrangement of the teeth.

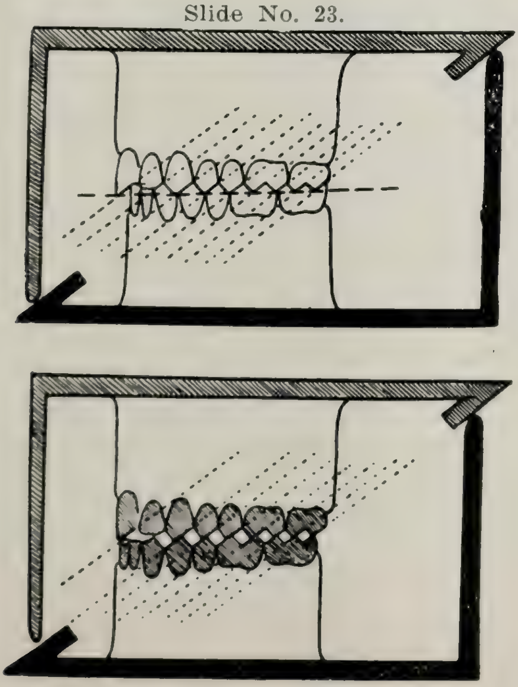
Now, I want to call your attention to an entirely different record, one which is not usually taken or necessary. I refer to the vertical inclination of the incisor path. Let us examine its influence upon the forms of certain facets of the teeth.

So far I have proceeded on the assumption that the inclination of the condyle path and of the incisor path were the same. I have done this for the sake of simplicity, and because you will find that the steep inclination of the incisor path often seen in natural dentures should not be reproduced in artificial dentures, at least for the average case. A very deep overbite of the artificial maxillary incisors gives opportunity for a strong forward push by the mandibular denture, which may often dislodge one denture or the other. My experience shows that for the average case a downward inclination of 40° is most satisfactory for the incisor path.

There are, however, cases where esthetic requirements may necessitate a deep maxillary incisor overbite, or where anatomical abnormalities may require it.

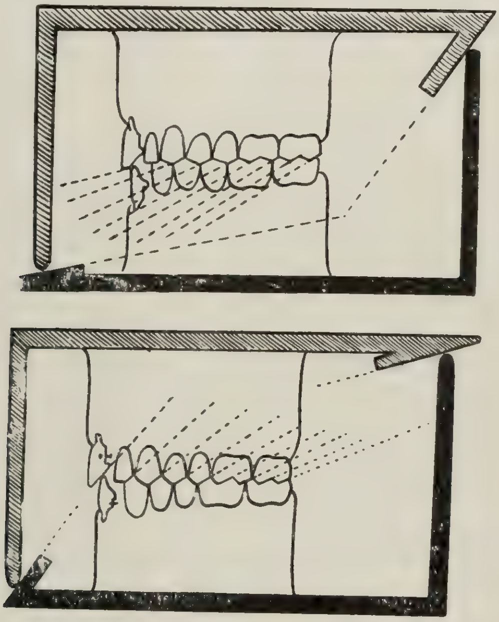
I now show you a slide in which, for purposes of illustration, the condyle path and incisor path have been given the same downward inclination.

Slide No. 23.



It illustrates diagrammatically the influence of the condyle path and the incisor path upon the inclination of the forward and backward-looking facets of all the teeth. The upper figure on this slide shows the relations of these facets when the teeth are in occlusion, the lower picture shows the relations when the teeth are in incising bite and how balance is maintained between the dentures during the incising bite.

Slide No. 24.

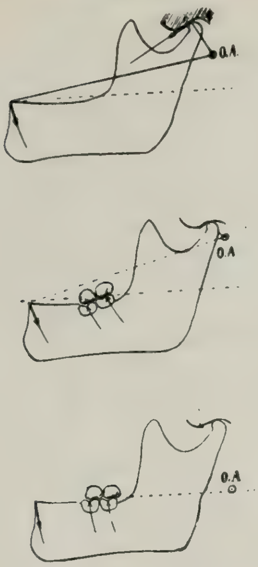


There will now be placed upon the screen a slide exhibiting two conditions in which the condyle path and the incisor path differ in inclination. In the upper figure, the condyle path is steep and the incisor path nearly horizontal, while in the lower figure, the condyle path is nearly horizontal and the incisor path is steep. You will note that in both drawings the forward-looking facets of the mandibular teeth and the backward-looking facets of the maxillary teeth take compromise angles between the two inclinations. It is unnecessary that I should bore you with the very complicated computations for establishing the inclinations of these facets. Suffice it to say that if the adaptable articulator be adjusted to reproduce these inclinations of the condyle path and the incisor guide incline, the compromises in the inclinations of the facets can be effected by automatic grinding without computation by the dentist.

THE EFFECT OF THE INCISOR PATH.

I now want to call your attention to another element in denture construction, the importance of which is frequently overlooked. It is the vertical location of the opening axis of the mandible.

Slide No. 25.



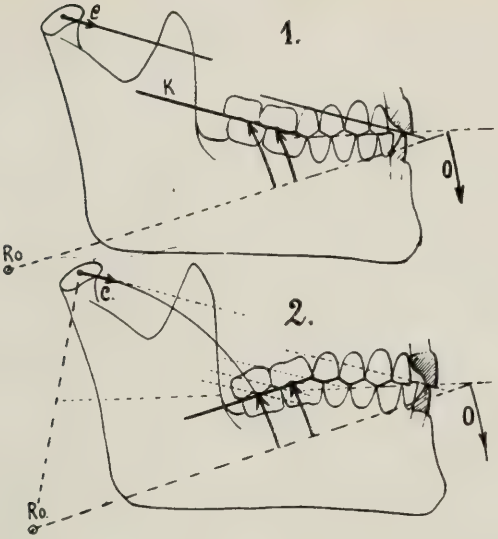
shows three diagrams of mandibles with the downward inclinations of different mandibular incisor paths traced upon them. A perpendicular has been erected to each incisor path, at the incisor point, and extended backward beyond the mandible. In the first two diagrams, a perpendicular has also been drawn downward from the condyle path until it crossed the perpendicular to the incisor path. At the intersection of the two lines, marked O,A, is the vertical location of the opening axis of the mandible.

The location of this axis is very important to the prosthodontist because it determines the antero-posterior inclination of the compensating curve. The function of that curve is to keep the occlusal surfaces of the teeth at right angles to the line of closure of the mandible. It is important to the stability of both dentures and to their efficiency that the occlusal surfaces should be always at right angles to the line of mandibular closure. If, as in Fig. 2 of this slide, the opening axis is near the head of the condyle, the occlusal surfaces must be arranged in a relatively steep curve, so that the mandibular molars may close at right angles to the upper molars.

If the opening axis is located in the occlusal plane, the teeth need not be set to a curve of Spee. They will function if the occlusal surfaces are kept in the occlusal plane.

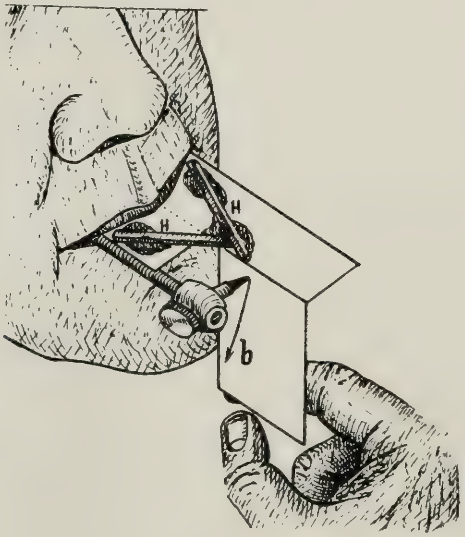
In some cases, the abnormalities in the location of this axis are such that the arrangement of the teeth must be very different from that usually seen. Slide No. 26 shows a diagram of a patient who presented for dentures. As dentures made in the regular way, like those shown in the upper figure of the slide, had repeatedly proven unsatisfactory, a record of the downward inclination of the incisor path was taken and it was found that, in opening, the mandidular incisor point moved downward and forward. A perpendicular was erected

Slide No. 26.



to the record of this path and the condyle path, and the opening axis of the mandible was found to be located far below the mandible itself. The molars were then set in a reverse curve, as in Fig. 2, so that the occlusal surfaces of the molars were at right angles to the line of closure of the mandible. The dentures arranged in this way were entirely satisfactory.

Slide. No. 27.



The next slide shows the manner in which records of the incisor point movements can be made in cases where an abnormality in the vertical location of the opening axis is suspected. A horizontal plane was attached to the maxillary occlusion rim and a projecting arm with a graphite point was attached to the mandibular occlusion rim. Half of the most anterior portion of the projecting horizontal surface was bent downward along the median line, as shown at B, and the graphite point adjusted to be in contact therewith. The arrow shows the usual course of the mandibular incisor point in opening movement.

No articulator can be constructed to reproduce such abnormalities as the last shown without being too complicated and cumbersome for convenient practical use. If the dentist finds a case in which he believes the opening axis to be abnormally low, he can easily make the experiment shown in this slide, can erect a perpendicular to the path from the incisor point, so that he can judge about how low the axis is, and arrange the teeth accordingly, increasing the reverse curvature as the axis descends below the occlusal surface.

I have tried to show you in this brief and imperfect manner the results of some of my studies of the past thirty years and some of the methods which I have found satisfactory in some of the abnormalities which result from the asymmetrical loss of the teeth and the changes which result in the temporo-mandibular articulation.

I have been able to show you this evening only the merest fragment of the studies upon which I have now been engaged for many years. If I have made my points clear, they seem to me to justify at least three conclusions:

That those of you who make dentures must regard all cases as average and bring all to one arrangement of the teeth, trusting to nature to reconcile any abnormalities with the dentures you have made. In this case you will find the use of any of the good non-adjustable anatomical articulators satisfactory. Your chances of winning are somewhat more than fifty in one hundred, and if you will have the patients grind the teeth in the mouth with an abrasive, they may be seventy-five in one hundred; or

That you must record the mandibular movements, determine which cases are abnormal, and arrange the teeth as well as you can to the abnormality. This will demand more patience in mastering the technic, but once the technic of operations is mastered, but little additional difficulty will be met in successfully fitting most cases with dentures. There will probably always remain a few cases which can be treated only by the denture specialist, because of abnormalities which are unusual in either degree or character.

That teeth scientifically formed for the average case or for the abnormality must be employed I should like to enlarge a little on this last point.

The slides which you have seen must have shown you that some of the more important details of tooth formation are not the result of chance or of some one's personal liking. They are determined by mandibular functions which can be reproduced only by long and complicated computations. What you have seen is only the beginning of the knowledge essential to correct formation of occlusal surfaces. But I am sure that it is sufficient to show you that there is little hope of your being able to grind with a stone any teeth forms of the required accuracy and efficiency.

Do not fall into the opposite error of expecting the manufacturer to provide you with teeth suited for each form of abnormality. I have been into that subject very carefully and you may accept my assurance that the best thing for your own interests the manufacturer can do is to furnish correctly formed teeth for average cases and leave to you the changes of form necessary for any abnormalities which the case may present.

I can not close without expressing my profound pleasure at the great interest which is taken in this subject in this country. It is much greater than in my own country, but it is now reacting upon the dentists over there, and I hope for an awakening which shall equal the awakening here.

And I wish to express to you as representatives of the dentists of America, my heartfelt appreciation for the very distinguished consideration which you have extended to the results of my study and the very great kindness with which you have treated me personally.

Dominion Dental Council

SUMMARY OF MINUTES OF MEETING HELD IN OTTAWA AUGUST 16TH, 1920.

AT the meeting of the Dominion Dental Council held in Ottawa August 14th to 16th, there was a full attendance of representatives. Two notices of motion to amend the constitution were submitted. One of these came from the representative from New Brunswick and called for the re-establishment of class "C" Certificates on the old basis of ten years regular, legal, ethical practice. The Council, however, held after a very full discussion that the Certificate of Qualification should only be granted upon the applicant passing an examination and it was consequently decided that an examination should be held for everyone. To meet the condition it was decided to create a new examination class so that hereafter there will be three examination classes instead of two as formerly. The time spent in practice over five years will be considered as equivalent to certain subjects. The classes are known as A., C. & D. Those who are required to take class "A" are those who have recently graduated (those who are attending a college located in an agreeing province can take class "A" progressively). These are required to take all of the subjects. Class "D" are those who have been in practice five years and less than ten. They must be able to show five years of regular, legal, ethical practice and pass in Operative and Prosthetic (both practical and written), Crown and Bridge

Work, Medicine and Surgery, Anaesthesia Materia Medica and Therapeutics, Pathology and Bacteriology, Orthodontia. For class "C" it is provided that they must have been registered on the first of January, 1908, and have been in regular, legal, ethical practice for ten years prior to date of application. These must pass an examination in Operative and Prosthetic (both practical and written), Crown and Bridge Work, Anaesthesia and Materia Medica and Therapeutics. The practical examination is the same in all classes and the papers written upon and the marks required for a pass are the same in all classes.

It was also decided to hold two regular examinations every year instead of one as formerly. The chief reason for this was that many of the students attending college found it difficult to return to the examination point so soon after getting away from the college term. The date of the fall examination this year will be October 18th, but each year hereafter the fall examination will commence the first week in September.

The notice of motion given by the representative for Alberta was fully debated and resulted in the fee for presiding examiners and representatives to Council being fixed at fifteen dollars per day and necessary expenses. The fee to the examiners for valuing papers was raised from twenty-five to fifty cents per paper.

The Secretary reported that there were 151 candidates at the recent examination, this being by far the largest on record.

The auditors' report showed the condition of the finances to be as follows:

RECEIPTS.

Cash, last report	$4,359.84
Receipts, class A	2,337.50
,, class C	18,200.00
,, class DD	9,900.00
Certificate re-issued	2.00
Interest, Victory Bonds	467.50
Total	$26,266.84
Balance due Society, petty cash	202.69

DISBURSEMENTS.

Liability payment, W. D. Cowan	$70.46	
Auditing	45.00	
		$115.46
Examiners' fees		754.50
Examiners' expenses		93.95
Printing and stationery		585.55
Postage and telegrams		191.42
Express		125.33
Executive expenses		641.95
Legal expenses		50.00
National Trust fee		9.35
Fees returned (rejected applicants)		1,965.00
Clerical assistance		600.00
Exchange (bank charges)		34.45
Salary (the secretary)		300.00
Engrossing		115.00
N.S.F. cheque		20.00
Bond premium		20.00
Investment (Victory Bonds)		17,000.00
Cash on hand		3,847.57
Total		$26,469.53

Signed—DAWSON & ROSBOROUGH,
Auditors.

The standard of Matriculation determined by the Canadian Dental Faculties Association is hereafter to be accepted by the D. D. C. for purposes of matriculation.

The fee payable for the re-issue of a certificate where the original was destroyed by fire or otherwise was raised from two to five dollars.

The Yukon Council having amended the Dental Act of that territory so as to accept the D.D.C. Certificate of Qualification, an application was made to have that territory treated as an agreeing district. This was referred to the executive for action.

The request of a number of parties, who had seen overseas service, that a part of their examination be waived because of such service, was considered and it was decided that "It is inadvisable in the interest of both the student and the public to waive any portion of the examination."

The officers elected were:

President—Dr. H. F. Whittaker, Edmonton.
1st Vice Pres.—Dr. Harry R. Abbott, London.
2nd Vice Pres.—Dr. Jas. S. Bagnall, Charlottetown.
Secretary-Treas.—Dr. W. D. Cowan, Regina.

My Dental Chair

I love it, I love it, and who shall dare
To chide me for loving my dental chair?
Long years has it stood in the self-same place,
Secure and firm on its oil-filled base;
'Tis viewed by many with anxious eye,
And its occupants change as the hours pass by,
For forms that are plump and forms that are spare
Have pressed the plush of my dental chair.

How well I remember my joyful pride
When first I stood at my new chair side,
For every patient its works I'd try,
I'd let it down and I'd pump it high;
I did my utmost to keep it neat,
I polished its levers and brushed its seat,
I oiled its joints with persistent care,
I was so proud of my dental chair.

Now and again, when its yielding seat
Supports the form of a maid petite,
I am sometimes nearly inclined to think
That the screws in its head-rest almost wink,
And it seems to ask with a knowing smile,
"How would my job suit you for a while,
With your arms entwining this form so fair?"
"Tut, tut, be quiet, you old dental chair."

At other times its ungrudged support
Is lent to forms of a different sort,
A bearded gaffer with senile fuss
May wish to be made edentulous;
And perhaps at the first submucous prod
He jumps from his seat and exclaims, "Good ———!"
I seize the old cove by his scanty hair:
"Sit still, you old fool, in my dental chair."

We are getting older, my chair and I,
As the patients go and the years pass by;
Our joints both creak as they stiff become,
While its seat is as bald as my cranium.
Quite soon I will come to the end of my toil,
When I shuffle off this poor mortal coil,
Dismiss my last patient with fatherly air,
And sit down and die in my dental chair.

Walter Rose, L.D.S., Sligo, in Dental Record.

Dominion Dental Council Examinations, 1920

THE following candidates have passed in Medicine and Surgery. These results complete the returns of the June, 1920, examinations.

Box, W. M.
Brownlee, H. G.
Brown, H. M.
Buttery, G. A.
Clermont, C. C.
Coysh, B. R.
Croft, L. H.
Countryman, J. G.
Caldwell, G. C.
Clark, V. A.
Charles, B. J.
Doore, J. C.
Day, H. R.
Ewart, W.
Fralick, R. F.
Fraser, J. E.
Graham, C. C.
Gemeroy, G. A.
Graham, J. A.
Haynes, N. W.
Herrington, J. H.
Heney, M. J.
Hughes, P. C.
Hugill, W. L.
Hesson, E. J.
Johnson, F. W.
Moyle, C. T.
Mann, H. E.
Mann, F. G.
Morrison, W. R.
Morrison, J. D.
McLachlan, L. E.
McCrostie, H.
Milne, J. A.
Moffatt, F. J.
Miller, W. J. H.
McIntyre, R. R.
McLaughlin, R. C.
Palmer, A. M.
Pommer, W. A.
Pickard, J. W.
Ross, H. A.
Stewart, C. E.
Smith, H. E.
Trueman, C. M.
Wood, P. H. ~~B.~~
Wilkes, W. R.

Symposium on Anaesthesia

The National Anaesthesia Research Society prepared abstracts of papers presented at the American Association of Anaesthetists recently held at New Orleans and these are published in the form of a symposium, that readers of Oral Health may be familiar with the newer thoughts in anaesthesia. The work of the N. A. R. S. is greatly appreciated by the medical, dental and surgical professions and particularly by those members of these professions who are called upon to administer general anaesthetics.—Editor.

DR. A. H. MILLER, Providence, R.I., (President's Address): The anesthetist is a silent watcher of the thread of life, ready to maintain its integrity by every means obtainable from study and application. The degree of danger attending the use of anesthetics is still unknown. The more postoperative deaths are studied the more evident it becomes that a considerable number of fatalities may be directly or indirectly traced to the effects of anesthesia. The teaching of the science and practice of anesthesia in the medical schools and clinical hospitals has been seriously neglected, probably from a lack of competent instructors. In hospitals the preoperative examination of patients, the choice and the administration of anesthetics are all generally neglected. In many clinics only one agent and one method of administration are available and must be used regardless of the nature of the operations or the condition of the patient. In the larger institutions the present conditions may be remedied through the appointment of full-time, resident anesthetists. They should supervise the preliminary examination of the patients, consult with the surgical staff in regard to the choice of anesthetic agents and methods of administration, supervise difficult cases, instruct juniors in practical anesthesia and be responsible for the condition of anesthetic apparatus. The surgeon of the present time who employs unskilled anesthetists justifies his position by the claim that he is able to oversee anesthesia. The surgeon of the next generation will not have had the required experience with anesthetics to uphold even this unsatisfactory relation. While the associated societies of anesthetists through their Official Organ and Year Book are trying to foster the literature of anesthesia, the larger medical and surgical journals are ignoring the subject. To remedy existing conditions it would seem advisable to encourage joint sessions of anesthetic societies with surgical associations with programs devoted to symposiums on pertinent subjects of common interests. A committee on statistics should be appointed to collect all available data and encourage reports on fatalities. This committee should cooperate with the National Anesthesia Research Society in establishing the extended use of the uniform anesthesia chart now in preparation. There should also be committees on instruction in medical schools and the standardization of anesthetic methods in hospitals. Agents and methods should be standardized among anesthetists themselves and they should also see to it that they are prepared to give instruction when occasion offers.

Accidents During Anesthesia

DR. R. M. WATERS, Sioux City, Iowa:—It is hoped that this report of fatal accidents under anesthesia, with the lessons drawn will enable others to avoid repetitions of similar catastrophies. Anesthetic mortality is much higher than usually supposed. Recently, Dr. Stewart, of Cincinnati compiled statistics of 10,700 operations for removal of tonsils and adenoids and found that 20 deaths had occurred in the series, being one death in less than 600 administrations. The statistics of an expert anesthetist may show a greater percentage of poor results than ordinary on account of the extreme number of hazardous risks handled. Among some 5,000 administrations during the past five years are included a goodly number of cases referred to me because doubt was present as to the advisability of using the routine anesthetist ordinarily employed. The

5 deaths occurring under anesthesia in my own experience have taught me the warning that every possible precaution must be taken in cases in which complicating disease has affected the heart muscle. Such patients under ordinary methods of anesthesia are apt to die unexpectedly. It is absolutely necessary in such patients to use a high percentage of oxygenation with nitrous oxid or ether. The anesthetic apparatus again should be of such a character as to admit of immediate oxygen perflation of the lungs under pressure in an emergency. Also in handling children and greatly enfeebled patients the apparatus used should make no additional respiratory demands nor allow for the excess accumulation of rebreathing. It should be remembered that patients may die of intense fear and also that worry about and dread of the anesthetic may delay digestion so that vomiting under anesthesia may cause death by the inspiration of vomitus into the trachea. In one such instance a piece of meat lodged in the glottic entrance and caused death in an intensely fearful subject before it could be removed. The possibility of respiratory obstruction from inhaled vomitus is increased in the semi-reclining position and diminished in the forward inclined sitting posture or in the horizontal position with the head low. Obviously also more fatalities are bound to occur from accidents under anesthesia in emergency than in properly prepared patients.

Anesthesia in Experimental Surgery

F. C. MANN, M.D., Rochester, Minn.:—The successful administration of anesthesia in experimental surgery and veterinary practice lags far behind its use in man. General anesthesia is preferable to local. Chloroform on account of its postanesthetic action usually defeats the purpose of the experiment. Nitrous oxid-oxygen may be used, but it does not maintain a constant anesthesia in laboratory animals and is difficult to administer while its cost precludes its routine use. Ether is the best anesthetic for use in most laboratory work. The reactions of the various species of experimental animals seems to be more uniform to ether than to any other general anesthetic. In the Division of Experimental Surgery and Pathology of the Mayo Foundation we have found the McGrath method of autoinhalation ether, induced by preliminary etherization in an air-tight cabinet very satisfactory for all purposes. Intubation during full surgical anesthesia is not difficult in dogs if the body of the animal is held perfectly straight on its back and the tongue is pulled straight forward to bring the glottis into full view. The intubation should fill the trachea and after insertion to the bifurcation should be slightly retracted. The ether container may be the simple can with regulatory valves or more complicated devices such as the Adson-Little insuflation machine or the Connell Anesthetometer. Smaller species of animals such as the guinea pig, rabbit and cat are best anesthetized by the old-fashioned cone method, following preliminary etherization in a bell-jar. The goat is very susceptible to excessive salivary secretion under ether and unless given preliminary morphin-atrophin and carefully anesthetized by intubation may drown in its own secretion.

Induction of Anesthesia and Analgesia by Oral Administration of Various Drugs With a Report of Cases

DR. A. FICKLEN, New Orleans:—The problem of dressing extensive wounds has always presented difficulties to the surgeons on account of the pain inflicted on the patient. During the recent war I saw dressing after dressing in which the surgeon took advantage of the stoicism of the soldier and inflicted pain that could have and should have been avoided. For this reason I welcomed the innovation of analgesia and anesthesia by oral administration of various drugs as announced in a bulletin of the American Red Cross after Drs. J. T. Gwathmey and Howard Karsner had tried out the method experimentally and clinically. I used the following strong formula: Chloroform, 5 c.c., Ether and Liquid Petrolatum, each 20 c.c. Approximately half of the patients had a short stage of excitement that lasted from 3 to 5 minutes and was succeeded by deep sleep and complete muscular relaxation. The pulse was full and bounding and ranged from 80 to 100. Many of the patients fell asleep in 5 minutes and did not rouse for several hours. The face was slightly flushed or normal in color. In about one-third of the cases the breathing was deep and stertorous, in the rest it was slow and regular but not snoring. Two of the series of some 50 personal cases did not sleep but had pronounced analgesia. In particularly extensive wounds I gave the patients a hypodermic of morphin, grain 1-6, 20 minutes before operation. More recently, since returning from service I have found oral analgesia equally serviceable in the dressing of painful wounds, setting of fractures, skin grafting and other painful procedures in civilian hospital practice. I have also been able to collect 7 cases in which the ether-chloroform-petrolatum mixture was used in obstetrics. The patients showed varying degrees of analgesia. The mixture did not seem to diminish the contractions of the uterus even when the patients were asleep. Apparently there were no ill effects on the child. In one case tests showed the analgesia sufficient for repairing lacerations. I have also found that syrup of Yerba Santa in one dram doses helps to disguise the burning taste of the mixture to a certain extent. The method should be further investigated and its routine value and scope established.

Experimental Studies on the Effects of Anesthesia in Shocks

DR. McKEEN CATTELL, Cambridge, Mass.:—These experimental studies on the effects of anesthetics in shock made in the Department of Physiology, Harvard Medical School, are a continuation of those initiated in the A. E. F. Surgical Research Laboratory at Dijon, France, and they have developed the following points: In the normal animal, ether, rapidly administered, causes a moderate fall in blood pressure, followed immediately by a recovery, so that by the time a degree of anesthetization is reached sufficient to cause a disappearance of the eye reflex the pressure is normal. In shock the animal becomes very sensitive to ether, the same degree of anesthesia produced under exactly similar conditions resulting in a marked drop in blood pressure. An increased sensitiveness to ether is brought about by any circumstances which tend to depress the general condition of the animal, such as low blood pressure, hemorrhage, severe operation or the injection of acid into the circulation. In a shocked animal, sensitive to ether, nitrous oxid and oxygen may be given in the most favorable proportions so as to produce the same degree of anesthesia produced by ether without causing a fall in blood pressure. Experiments on the heart volume in intact cats and on contractions of the isolated turtle heart, together with deductions from blood pressure show that ether from the very beginning of its administration results in a depression of the heart and a decrease in its output, which is sufficient to account for the fall in pressure in both the normal and the shocked animal. Large doses of adrenalin injected intravenously in shocked animals usually results in the disappearance of the sensitiveness to ether for a period of an hour or more. The evidence indicates that adrenalin acts on the heart in a manner which antagonizes the effects of ether. Pituitrin does not influence the pressure drop produced by ether in the shocked animal. Determinations of leg volume with a plethysmograph, perfusion experiments, and results obtained from the injection of ether directly into the circulation, together with the form of the blood pressure curves indicate that ether causes a contraction of the peripheral vessels in the normal animal. This constriction is caused by (a) a direct stimulation of the vasomotor center and (b) by a reflex to the fall in pressure resulting from depression of the heart. In shock no evidence of a vaso-constriction produced by ether was obtained, and pressor effects from asphyxia or sensory stimulation become less or are entirely absent. The cause of the greater depressing influence of ether on the blood pressure in shock is a disturbance of the vasomotor system. The usual compensatory constriction no longer occurs to offset the decreased output of the heart, so that there is no recovery of the blood pressure during the inhalation of ether, but instead the pressure continues to fall.

The Open Method of Nitrous Oxid-Oxygen Anaesthesia

DR. JAS. T. GWATHMEY, New York City:—This method is offered as a substitute for the open-drop or any other method of etherization and also as an aid in anesthetizing certain patients to whom the closed method seems a burden. A mask twice the size of the usual drop-ether mask is used and is sufficiently large to hold a full inspiration of an adult. The mask is covered with several layers of gauze and scented with essence of orange or oil of bitter orange peel. The anesthetic is started with three holes of nitrous oxid and one of oxygen and in 10 or 15 seconds the anesthol valve is turned just enough to have the gases barely bubble through and from this on it is very gradually increased until there is a slight bead on top of liquid. In 1 minute to a minute and a half the patient will be unconscious but not anesthetized. The technic from this on will vary with the substance to be used in connection with the gas-oxygen. If only anesthol is added it is turned on just a little more until the breathing of the patient becomes automatic when it is turned back to the second position and the oxygen is turned on to the second hole and the gas-oxygen remains thus proportioned throughout the operation, the depth of anesthesia being regulated by the anesthol. Toward the close of the operation the anesthol is turned off then the nitrous-oxid and the patient is oxygenated for short time before leaving the table. It is quite possible to awaken the patient at this time but he is best left undisturbed to sleep through the postoperative pain zone. Paraldehyde may be used to advantage in this technic of anesthesia. It combines very readily with gas-oxygen and these gases need only to be passed over the paraldehyde to carry a sufficient amount to the patient to accomplish full surgical anesthesia without the stage of excitement. This method is of especial value in dentistry and obviates any struggling during induction on the part of alcoholics and athletes while it also provides the extraction specialist with a considerably longer period of anesthesia for his operation. The principal objects in using this method are to abolish respiratory difficulties and obtain more complete relaxation than is usual with any closed method and at the same time reduce to a minimum the disagreeable after-effects obtained with ether as usually administered. It is becoming more apparent as the study of anesthesia advances that a combination of narcotics and anesthetics isolates the brain from reflex stimuli more thoroughly than any one method of general inhalation anesthesia now in common use.

Why Not Be Sane?

THIS query is raised as the result of a long observation of men and their methods, not only in the practice of dentistry but in medicine as well. The intimation is, of course, not made that dentists and medical men are insane—far from it—but the fact is that in some sense, and at certain times, professional men seem to have a tendency to run off so far at a tangent as to encourage the inference that they were lacking in mental balance. Take the various fads which have from time to time ridden rough shod over the common-sense of dentists. To enumerate only a few we may cite copper amalgam, cataphoresis, the "New Departure Creed," emetin for pyorrhea, analgesia, hypnotism, and more recently focal infection. The moment this latter is placed in the category of a fad we can hear a cry of holy horror go up from one end of the land to the other. The sacred precincts of a sublime truth are being invaded according to the notions of some of our very good men, and in this age a man must have much temerity to question the far-reaching effects of focal infection. Nor is it intended here to minimize the fact of focal infection, or its baneful influence under certain conditions, but merely to point out that it has been given undue significance in our literature, and particularly that the teeth as a causative factor in systemic disease have been exaggerated out of all proportion to their real merits. We have been given a mental bias over this question which has resulted in untold harm.

Why cannot we be sane when it comes to judging the merits or demerits of any theory? Why must we constantly go to extremes? Why must poor humanity suffer so grievously because of our lack of mental balance? We do not seem to profit one iota by the blunders which we have made in the past. We go on permitting every hobby to take the bit in its teeth and carry us away beyond the goal.

The argument is often advanced that much good results from fads, and this in a certain sense is true. Without the enthusiasm which comes from following a fad there would not be much real progress, and this is acknowledged freely and frankly. Not only this but in nearly every one of the fads which have hit dentistry there was something of real merit—something which at the time entitled them to consideration.

But acknowledging all of this the fact remains that in a survey of the extremes to which the profession has gone it will be found that vastly more harm than good has been done, and in the ultimate it would have been better if the fad had never come.

Above all men on earth it would seem that the professional man was the one who should exhibit balance and clarity of reasoning. So much depends on his judgment in the critical issues of life and death that he should cultivate sanity and aim to preserve his equilibrium under all kinds of pressure. But instead of this he seems the first to be deflected by every passing whim, and to lead his patients into the highways and byways of experimentation. Men will make mistakes—it is inevitable—but they need not go on making the same mistake over and over again, to the serious injury of those whom they serve. The present plea is for breadth of vision, and greater sanity in our methods.

C. N. Johnson

MENDING BROKEN PLASTER CASTS.—As all dentists know to their sorow, plaster casts are frequently broken. To save the patient inconvenience, and the dentist time of having another impression made, it is highly desirable that broken casts be mended; but heretofore it has been difficult to find a cement that would work well on the plaster. Due to porosity of the material, ordinary "stick-ems" are absorbed by the plaster, and the plaster and the edges fail to stick together. Dr. James A. Moag, who has been experimenting with various cements,has found that a pyroxylin cement best serves the purpose. He says he finds it indispensable for repairing plastic casts—the best thing, in fact, that he has ever heard of or used. The cement is waterproof, and is made on a soluble cotton base. It holds together perfectly the severed edges of the broken plaster casts.—*Dental Review.*

ORAL HEALTH

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EDITORIAL

Dental Services—Department of Soldiers' Civil Re-Establishment, Canada

THE regulations covering Dental Services in the S.C.R. have been amended under date of 14th August, 1920, in such a way as to virtually place the Dental Services under the control of the Medical Department of the Soldiers' Civil Re-Establishment.

The Dental Profession, through an accredited committee, made Dentistry's position clear to the Department of Soldiers' Civil Re-Establishment regarding this matter, over a year ago. At that time the absolute necessity for the organization and administration of the Dental Services as a separate department was urged in the interests of efficiency and economy, and to ensure the co-operation of the Dental Profession and of the individual Dentists of the Dominion. The attitude of the Dental Profession upon the principle involved has been either misunderstood, or the recent amendments to the Dental regulations of the S.C.R. have been adopted without the knowledge of the Minister. Most Medical practitioners freely admit that they have not the necessary knowledge to diagnose or treat Dental disease, or to administer a Dental service; but there seem to be a few Medical men left,—principally those occupying Governmental positions,—who believe that Dentists must carry on their work as a part of the Medical service or not at all.

That Dentists may fully appreciate the important principles involved in the recent amendments to the S.C.R. Regulations, the following summary is published:

First—The Director of Dental Services is made responsible to the Director of Medical Services for the proper direction of the Dental Services.

Second—Dental Surgeons (S.C.R.) employed in "medical institutions" are responsible directly to the superintendent of such institution. The superintendent of same shall approve of all reports and requisitions for dental supplies.

Third—Dental Surgeons (S.C.R.) not employed in medical institutions are responsible to the Unit Medical Director, who will receive all reports and requisitions for supplies.

Fourth—Civilian Dentists employed from time to time by the S.C.R. shall be under the control of the Unit Medical Director, Dental work is not undertaken for a patient without the consent of the Unit Medical Director. Should the work involve an expenditure of more than $20.00, application for permission to proceed will be forwarded to the Director of Dental Services—after such approval is given work proceeds under control of the Unit Medical Director.

Fifth—The Unit Medical Director examines and decides upon the admission of dental cases, names the institution to which they are to be admitted, and determines whether subject is to be an in-patient or an out-patient.

Sixth—Accounts for dental services are based upon a fixed schedule and are submitted to the Unit Medical Director for his approval and action.

Seventh—Transportation warrants for patients requiring dental treatment, or for personnel of the Dental Branch proceeding on duty, are issued upon request of the Unit Medical Director.

Eighth—Requisitions for consumable Dental supplies must be approved by the Unit Medical Director. Also when additional dental equipment is required the Unit Medical Director must approve.

Ninth—When it appears to a Unit Medical Director that alterations or repairs of any kind are required in a dental clinic, the Unit Medical Director suggests alterations to the Engineering Branch and advises the Director of Dental Services of the same.

What is Dentistry's logical answer? One cannot conceive of a conscientious Dental practitioner proceeding under such regulations. If the Dental Service is to be efficient, and if Dentists are to be held responsible for such service, they must be in a position to organize, administer and control the service. If responsibility for this work is to rest in other hands, then Dentists must of necessity stand aside entirely and let those who assume the responsibility do the work.

We believe the returned soldier appreciates the work of the Canadian Army Dental Corps, and will support the Dental Profession in demanding that the Dental Service for returned men be administered and controlled by Dentists.

It is only Dentists, knowing what should be done, who realize the great need for adequate Dental service for returned men. Canadian Dentists stand ready to supply that need in the best way and to the fullest extent, but demand that they be not hampered by administration and control by members of another Profession.

Department of Education and Public Health

THROUGHOUT the provinces of Canada there has occurred more or less discussion as to whether school health activities should be carried on under the control of Departments of Health or Departments of Education. It would appear that a happy solution has been found in New Zealand through combining the offices of Minister of Education and Minister of Health under a common head, thus avoiding the serious disadvantages of divided authority.

The Editor of the New Zealand *Dental Journal*, in discussing the appointment of Hon. C. J. Parr to take charge of both of these portfolios, says that

"The progress of the child from an educative standpoint is so exactly correlated to its purely physical condition that the two may be regarded as almost complementary to one another. So intimately interwoven, indeed, are the interests of both Departments that it is difficult to understand the wisdom that has dissociated them so long. Nowhere is this relationship more clearly manifest than when we come to consider the question of dental disease so appallingly prevalent among our school children, and this, whether we view the question from either its individual or its national aspect. The campaign against disease has been hindered because of divided authority. What has been two men's business has been no man's business, and vital issues have sometimes suffered in this game of political shuttlecock.

"School medical and dental inspection but emphasized a state of affairs long recognized as existing by the teachers themselves. We have in the past dwelt too much on school education and too little on school hygiene. So glaringly apparent and so universal have been the physical disabilities under which our children have labored that one is tempted to ask whether Ministerial timidity to embark on so prodigious a task has not alone been responsible for the delay in finding the remedy."

In the Province of Ontario the Honorable R. H. Grant, Minister of Education, has shown a keen interest in the organization of an efficient School Dental Service for both urban and rural districts, and has appointed Dr. F. J. Conboy as Provincial Dental Officer to develop this important work. Some three hundred members of the dental profession have co-operated with the Department of Education in making a complete dental survey of the schools of the province. It is to be hoped that other provinces will follow, and that a dental survey of the school children of the whole Dominion may be an accomplished fact.

Nova Scotia has shown leadership in the organization of rural health caravans, which move from district to district, thus bringing dental service to the school children of outlying sections. Rural boys and girls are just as valuable assets of the community as are city children, and Government health plans must be developed along such lines as will guard the health of all children, whether they be residents of urban or rural districts.

Notes

DR. Thaddeus P. Hyatt writes *Oral Health* that he is "forming a collection of badges used at the different Dental Conventions, National, State or Local; also past and present. Fraternity pins, buttons, or badges are also desired. This collection will be beautifully mounted and presented to some Dental Museum. Any contribution sent to me by members of our profession will be appreciated and acknowledged."

Contributions should be sent direct to Dr. Hyatt, care Metropolitan Life, New York City.

A READER of Oral Health, who recently gave up general practice, has for sale a number of operative instruments, forceps, teeth, crowns, burs, etc.; also several sets pyorrhoea instruments, including a set of Carr scalers. Will those interested kindly communicate with Dr. S. W. Bradley, 206 Laurier Ave. West, Ottawa?

DR. W. E. CUMMER would like to purchase the following books, now out of print, and would appreciate hearing from anyone desiring to dispose of copies: Noyes Dental Histology; Kingsley, Oral Deformities.

"There is no higher rank
than that of Worker."

WESTON A. PRICE, M.D., D.D.S.,
Cleveland, Ohio.

DR. PRICE is one of those who believe that in supplying modern dental service diagnosis is the most important factor leading to successful treatment, and he has recently added to his office organization in a way which enables him to devote almost his entire time to this phase of his practice. Dr. Price has also installed, in connection with his office, hospital facilities where patients may remain until convalescent, or where certain cases may be kept under continual observation.

The Dental Profession is indebted to Weston A. Price for his untiring efforts in Dental Research. When Dr. Price learned of the effort being made to raise a Dental Research Fund among Canadian Dentists, he immediately subscribed fifty dollars to the Fund. This action on the part of Dr. Price should be an inspiration and stimulus to all Canadians.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

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Address Delivered to a Mass Meeting of Toronto Dentists, Held at the Royal College of Dental Surgeons, in the Interests of the Canadian Dental Research Foundation

By Weston A. Price, M.D., D.D.S., Cleveland, Ohio.

DR. PRICE'S address was most eloquently and forcefully delivered, and many of the more recent scientific truths were presented in a way which enabled practitioners to apply these principles to their daily practice. The address was profusely illustrated by a series of lantern slides, many of which were beautifully colored. The report of Dr. Price's address is as follows:

A new truth is a new sense, for with a new sense you can see things you could not see before and that others cannot see. The practitioner who through experience and study grasps a new truth and applies it in his practice has a new sense which enables him to render better and more scientific service to his patients.

The question of whether a pulpless tooth is always a non-vital tooth was discussed, and while some argue that, as a tooth derives nutrition from surrounding parts, a pulpless tooth is not necessarily a dead tooth; it was the judgment of the speaker that, just as a tree which is nearly all dead is considered a dead tree, so an infected pulpless tooth is virtually a dead tooth.

Those cases were referred to where patients are suffering from dental disease, with apparently no trace of systemic disease resulting, though pus may be discharging freely into the mouth. It is well to bear in mind that in many of these cases the discharge is virtually sterile, being composed largely of leucocytes. However, in the final analysis it is entirely a matter of the reaction of the patient. With a lowering of the vital forces the conditions described would possibly become a menace to the health of the patient. Other patients, again, because of a lower vitality and lack of strong reaction, would, with much less infection, suffer serious if not fatal systemic disease.

It is sometimes argued that it is not absolutely necessary to perfectly fill and perfectly sterilize root canals, but Dr. Price preferred to have the comfort which the knowledge of perfect sterilization and perfect root filling gives.

Numerous slides were thrown on the screen which clearly showed, by dissection of the part, that roentgenograms do not give a complete picture of the parts, both as to the area and exact location of the resorption or the direction of the root canal. It was also shown that roentgenograms were occasionally misleading in the detection of malignant growths in the auxiliary tissues. It was the judgment of the speaker that if dentists were compelled to extract teeth themselves, instead of referring these cases to a specialist, the pathology in these diseased conditions might be intelligently studied.

Many slides were also shown illustrating both rarefying and condensing osteitis, and showing that in many cases of resorption (rarefying osteitis) nature's forces are busy in the formation of condensing osteitis beyond the rarefied area. This is nature's defence, the formation of this condensed area (where the blood vessels are obliterated), enabling the vital forces of the body to prevent general disease. In many cases nature may overcome this local infection for years, but as the patient becomes older, and the natural forces of the body are lowered, arthritic and other general lesions develop.

Attention was drawn to the necessity of realizing that in these cases of condensing osteitis infection frequently penetrates the hardened bone even to the depth of a quarter of an inch, as shown by the fact that when a culture taken from this depth in a patient suffering from arthritis was injected in rabbits, 90 per cent. developed an arthritic lesion.

Should we confine our diagnosis of these cases to rarefied areas shown up by roentgenograms, we would entirely overlook all of those cases of infection where nature's reaction has been of the condensing type.

Some patients may carry a large quantity of infection without injury indefinitely, but as they get older resistance is lowered, and under certain systemic diseases, such as influenza, resistance to streptococcus infection may disappear even within a few hours.

It is important to bear in mind that the vital consideration is the reaction of the individual to the infection, which may result in small or large rarefied areas, or condensing osteitis, according to the nature of the infection, whether it is of an acute or chronic type.

Dr. Price referred to many very remarkable recoveries as the result of the removal of foci of infection about the teeth, and mentioned particularly a man whose weight dropped from 176 to 122 lbs., and after six months in a sanitarium was over a year trying to regain his health. This patient was rejected for life insurance because of an "organic heart lesion." The removal of the local dental infection proved that there was no organic lesion, but that the infection caused an irritation which produced all the symptoms of a heart lesion.

A case was also instanced of a boy who had suffered from a chronic arthritic condition, and represented one of those cases which "would have been better if it had been worse." The infection was of a chronic type, which failed to bring about a local reaction, and the X-ray showed no resorption of the surrounding tissues. Dr. Price relies very frequently upon thermal tests in the indication of dead teeth, and by this means discovered such a tooth in the case of the boy referred to. The patient had been in bed from the time he was twelve until he was sixteen years of age, the blood count dropped from 16,000 to 8,500, and the boy is now up and around. This case was one where the local reaction was condensing osteitis, instead of the usual rarefying osteitis, and where the X-ray, therefore, failed to indicate the presence of the infected area.

An interesting case was that of a boy with a heart lesion and susceptible to streptococcus infection, where an infected pulp was discovered in a tooth without exposure. In this instance the infection was injected into rabbits, and in 33 rabbits 93 per cent. developed a heart lesion.

Another interesting case of the many referred to was that of auditory neuritis, which was found to be due to an infected vital pulp without exposure, though the tooth was carious. The tooth was extracted, and the streptococcus infection found was injected into animals, when it was found that the majority of the rabbits developed trouble in the nerve trunks, thus showing the tendency toward affinity of infection to similar tissues. In this instance the patient's hearing was restored.

Still another case was that of insanity resulting from an infection in an anterior tooth, where a patient who had been in five hospitals in five different States was cured of an affection of the mind, thus showing that dental infection may produce a sensitization which may result in some form of insanity.

A case was cited of iritis, where there were five successive attacks, the patient finally losing the sight of the left eye, and frequent treatments by oculists gave no relief. The X-ray showed absorption around two or three teeth, with condensing osteitis around one tooth, which did not respond to heat and was extracted. The culture was injected into a number of rabbits, and within 72 hours there were distinct symptoms of iritis in the rabbits.

Another case was shown where a denture was inserted over a number of roots, which brought about a condition of infection under pressure, and the susceptible tissue in this case was muscle tissue, resulting in myositis and torticollis. An injection in ten rabbits of this infection resulted in four rabbits developing neck involvement, and a moving picture film was made showing these rabbits moving about with their necks twisted.

The case of Theodore Roosevelt was also referred to, where rarefaction was indicated upon certain teeth, but the dental condition was not suspected until it was too late. Dr. Price surmised that Roosevelt in his early life contracted fever, which resulted in the death of certain dental pulps, and urged the necessity for periodical examination by the dentist, even though the patient suffers no discomfort, and particularly following an attack of fever.

Dr. Price claimed that in 20 per cent. of teeth involved he could find no evidence of infection by means of the radiogram.

The speaker then discussed at some length the question of sterilization of infected teeth, and stated that it was exceedingly difficult to sterilize a tooth in the mouth. He jokingly gave it as his opinion that the best way was to "boil" them. Sterilization by silver nitrate neutralized by formalin was high in efficiency, as also was formalin with hot air and chloramin (not dichloramin). However, it was pointed out that, owing to the effect on the surrounding structures, it was questionable whether a solution of formalin as high as 10 per cent. should ever be used in a tooth. In silver nitrate medication it was better to neutralize with eugenol, and thus avoid the ill effects of formalin.

Reference was also made to the disadvantage of using any solvent in connection with chloropercha in root canal work, as a solvent disappears in time, leaving a bad effect upon the root filling.

In closing the address Dr. Price referred at some length to the relationship between oral infection and influenza complications. Influena rapidly destroys the body's resistance to pneumonia, the plasma of the lung becoming infected. Dr. Price studied many cases of influenza in different hospitals when the epidemic was at its height, and claimed that in those cases where there was open infection in the mouths of the patients pneumonia very frequently followed.

USE DENTAL LAC AND SPENCE PLASTER.—In making the tooth models for jacket crowns, if Dental Lac is used for impression and Spence metal used to pour the models, beautiful results will be obtained.—*Elmer S. Best, Dental Summary.*

The Dental Hygienist—Pro and Con

AT a recent meeting of the Alumni Society of the Dewey School of Orthodontia, Dr. H. B. Hamilton, of Ithaca, New York, read a paper entitled "The Dental Hygienist in Orthodontic Practice." The paper appeared in the *International Journal of Orthodontia and Oral Surgery*, and we publish it in full, along with the discussion contributed by Dr. Martin Dewey, of Chicago. These contributions present the hygienist question from two different standpoints, and illustrate the widely divergent views held by members of the profession regarding this important problem.

Dr. H. B. Hamilton, Ithaca, N.Y.—Ever since orthodontia became a specialty of dentistry there has been more or less controversy between the dentist and the orthodontist as to the effect on the teeth by the wearing of appliances. The dentist has blamed all sorts of injuries to both hard and soft tissues to the wearing of appliances. The orthodontist has claimed that proper appliances can cause no injury.

The orthodontic appliances in themselves, if properly designed, constructed and applied, and with the proper care, can cause no injury, but if any of these factors are at fault there is undoubtedly danger to the oral tissues.

On the other hand, the orthodontist is constantly finding cavities and imperfections that the dentist overlooks. Unless these are cared for before the orthodontic work is begun, they may later be attributed to the appliance.

We also find the greatest difference in tooth structure and its liability to damage. In some mouths there seems to be almost a complete immunity to caries, while in others it will show evidence on the slightest provocation. There is also the greatest difference in the care which the patient gives to his teeth. Some patients are able to keep their teeth absolutely clean no matter how crude or complicated the appliance is, while others seem unable to keep them in a state that can be said to approach cleanliness, even without appliances. Instruction and continual lecturing will not entirely overcome this fault in all cases.

Before starting a case the mouth should be placed in the best of condition by the family dentist. With the placing of appliances the responsibility for the mouth rests largely on the orthodontist. Prophylactic treatment seems to be the best method of meeting this responsibility. To do this work oneself becomes burdensome, and as the great majority of our patients are school children, it is not always possible to give every patient the prophylactic attention that may be needed, and make necessary adjustments in the appliances for all the patients that have to be cared for out of school hours.

It is here that the dental hygienist is of the greatest value, not only in relieving us of this burdensome task, but, what is more important, in conserving our time.

A dental hygienist is a person licensed by the state to remove stains and accretions from the exposed surfaces of the teeth under the supervision of a practitioner of dentistry, and to teach oral hygiene. The chief effort of the hygienist is to make the teeth clean and to instruct the patient so that he will maintain them in a cleanly condition. It is not necessary to go into the technic, but sufficient to say that the hygienist will do this work more thoroughly and efficiently than the average dentist.

Neither is it necessary to go into the subject of the training of the hygienist, as the movement is now so well known in the dental profession. It may be said that the course is certainly thorough, and that the student gets a large amount of practical experience. The various institutions teaching dental hygienists have orthodontic clinics, and it should be, and probably is, easy for the student to get some actual experience with orthodontic practice. The following quotations from letters from the heads of some of these institutions show that they are alive to the possibilities.

"We give them talks on the need and value of their services to the orthodontist."

"The dental hygienist receives theoretical and practical training in the handling of children, the importance of child hygiene and the effect of any oral abnormality upon the health of the child."

"The dental hygienist receives intensive training in oral prophylaxis."

"She is also instructed as to how to teach children to keep their mouths clean and can give them wash bowl demonstrations in the office."

"She receives lectures in dental anatomy, and in the tooth morphology class must carve a complete set of teeth by hand."

"Lectures on occlusion and malocclusion are given."

"She is given instruction in making and separating models, cleaning appliances, and in thorough prophylaxis of the mouths of orthodontic cases."

That this instruction is bearing fruit is proved by the fact that I have had several cases referred to me by our local school hygienist when the family dentist had been negligent or overlooked the malocclusion.

In addition to instruction noted in the above quotations, the hygienist is taught to make an examination of the mouth, to note all defects and abnormalities, and to properly chart such deficiencies. She also receives instruction in X-ray work—something of the machine, the technic of taking the picture, the developing and printing.

In our practice after the preliminary arrangements are made the child is turned over to the hygienist to prepare for the taking of impressions. She takes the child and seats him in the chair and, while explaining the procedure, endeavors to interest him and gain his confidence. The orthodontist may be able to do this just as successfully as the hygienist, but the latter is oftentimes able to accomplish this quicker and more effectively, because a child will usually respond quicker to the efforts of a woman.

Before the bands are fitted and cemented the hygienist can remove the separating wires and thoroughly cleanse the teeth to be banded and the adjoining teeth. Before the appliances are put on she should thoroughly cleanse all of the teeth. After the appliances are in place she should teach the child how to care for the teeth with the appliances on and see that proper care is taken. If proper care is not taken it is her duty to persist in the effort with the child until a reasonable result is obtained.

While the case is in progress and comes in for adjustment it is examined, and if necessary to remove the appliance the case may be turned over to the hygienist for the removal and to give the proper prophylactic treatment. During this treatment she should note carefully the condition of the cemented bands, the evidence of beginning cavities, an irritated gum, and, if there is anything suspicious, to immediately call the attention of the operator to it.

It is not intended that the operator should rely entirely on the hygienist for this, but should, in fact, look for these conditions at each visit; but the prophylactic work of the hygienist should include all this. Thus she may note something that might be overlooked by the operator, as it is, of course, more easy to observe these things when giving attention to each individual tooth.

While the hygienist is at work on the first case, the operator takes up the second one and gets that under way. By this time the hygienist is through with the first case, and the operator returns and replaces the appliance with such adjustments as are necessary. And so on with the other cases.

I do not mean to say that every child receives a prophylactic treatment at every visit. The frequency of the treatment depends on a number of factors, such as the amount and nature of the appliance, the care the patient gives to the mouth, the diet of the patient, etc. It is desirable, however, that at every visit the mouth should be looked over, and if there is any evidence of neglect at any point it should be corrected and the child's attention called to it. By this constant vigilance possibly more prophylactic work in the aggregate may be done than is absolutely necessary, yet the individual treatments may require only a few minutes, and the final results are most desirable. I am sure of this, because I have had cases carried over a number of years with very little reparative work done during the period of treatment, while previously the dentist complained that it seemed almost impossible to keep the teeth in repair.

While the foregoing is the most important aid to the orthodontist, there is a great deal of time when patients are not available. Yet between times there are a thousand and one things to be done. Impressions are to be prepared, models to run and separate and also to carve. The hygienist can easily be taught to do them, and if she has any mechanical skill can also be utilized to a more or less extent in the making of appliances.

There are also the books and records, as well as the correspondence, that may be turned over to the hygienist.

It is unnecessary to refer to the influence of the hygienist in the office and the many little ways in which she can keep things up to a higher standard. Being an operator, she may appreciate these things a little better than the average assistant.

I do not know that I can close this paper better than by quoting Dr. Crosby, of New London. "The reason why we could not do without a hygienist is that we are in duty bound to bring the teeth through the period of orthodontic treatment in as good condition as we received them."

Dr. Martin Dewey, Chicago, Illinois.—If you have followed the dental literature and my writings in the last few years since the dental hygienist has been forced upon the dental profession, you would probably know I have been greatly opposed to it from beginning to end. I have been accused of not believing in oral prophylaxis, which is not true. I am opposed to oral prophylaxis being handled by anyone who has less knowledge than a dentist. Oral hygiene is too important a subject, it is too responsible a subject, to be turned over to a girl who has had only nine months' training in some infirmary or clinic which covers most of the studies in the dental curriculum.

Dr. Hamilton states that these girls get a thorough course. Gentlemen, if you can give a thorough course in nine months you may as well close up the dental schools. When my friend Hamilton says that the dental hygienist is better able to do this work than the average dentist at the end of a nine months' course, it is a very unsafe statement to make.

The oral hygienist has burst upon the dental profession as a sort of propaganda. You may remember that a few years ago oral hygiene was advocated as being the saviour of the world. The statement was made that a clean tooth never decays, which statement cannot be refuted, because no one ever saw a clean tooth. Following that the Forsyth Infirmary was established; then came the Eastman Infirmary at Rochester, New York, and also the activities that were carried on at Bridgeport, Connecticut. These men advocated oral hygienists, they made big talks, saying that they were going to be necessary in our public schools, that there would not be enough dentists to take care of the public or to clean the teeth. So the solution advocated was to give girls nine months' training, in order to prepare them as oral hygienists, whereas it takes the dentist four years to complete his course. What are they doing? They are creating a demand for dental service to a certain extent and limiting the number of dentists. They are educating these people to have their mouths cleaned and to have dental service. The danger of the dental hygienist is now cropping up. In spite of the work being limited to the cleaning and polishing of teeth, Dr. Hamilton in his paper states that she takes off appliances. The minute she takes off a regulating appliance she is stepping out of her sphere and becomes a violator of the law.

The next thing you will have a lot of advertising dental hygienists, and, furthermore, you will have a lot of them telling the dental profession what to do.

What is the condition in Chicago? During the influenza epidemic nurses were trained by the Department of Health, so that the directors of hospitals had difficulty. These girls, who were trained supposedly for the purpose of saving humanity and working in public schools and in clinics and in hospitals for the benefit of the public, are going out nursing private cases. They are doing things they should not be entrusted to do or by anyone with that amount of education,, because it is a well known fact, even if a dental student takes a four years' course, a lot of them cannot clean teeth. If you cannot teach a dentist to clean teeth in four years under college instruction, you certainly cannot teach a girl to do so in nine months.

Dr. Hamilton spoke of these hygienists taking impressions and making models. I still contend that if they can do all of that, the dental schools may as well close up. You all know the difficulty of taking impressions and of making models. Will you admit that a girl of nine months' training can do better than you can? If so, you may as well quit. I don't believe she can.

Another thing: we have had the dental hygienist forced upon us. It is illogical. It is not right. We educate the public for dental service, but educating the oral hygienist is not going to improve dental service.

The greatest prophylaxis measure the dental hygienist cannot legally perform, and that is the insertion of a prophylactic filling.

In a conversation with Dr. Hyatt, of New York City, who is one of the enthusiastic advocates of the oral hygienist, he made the statement that as a result of investigation in one of the New York schools 63 per cent. of cavities were found in the occlusal surfaces of teeth, and simply polishing the occlusal surfaces would not prevent decay. That was decay from anatomical fissures, etc. The oral hygienist could not get down to and remove the decay from the occlusal surfaces of teeth. The only remedy is a prophylactic device which the oral hygienist cannot insert, and here is a great function that she cannot perform.

My friend, Dr. McCarty, says that his oral hygienist takes off appliances and does a lot of other things. Pretty soon she willl be doing a lot of things outside of his supervision, which is another foolish thing under the law, because in most states we have a law which says that she must work under the supervision of the dentist. She takes a course, is granted a license, and then she is told she cannot do this or that unless it is done under the supervision of a dentist. In other words, they make this girl something, and then take it away from her. They give her a license to do something and then say she cannot do it. That keeps her from going out and working for herself, but as the number of hygienists increase they will go before the state legislature and make you look ridiculous, because any man with legal knowledge knows that if she has a license she has got a right to do something without being under the supervision of the dentist. These hygienists will change the law so that they can establish offices for themselves, like we have manicuring parlors, and the people will patronize them and say that oral hygiene is a good thing. As a solution of the problem you will see oral prophylaxis in the hands of hygienists who are not doing the people any good. It is really a fortunate thing that most hygienists from these schools will humbug a certain class of people who can afford to be humbugged. They are rendering inferior service. They will have all the hospitals and clinics working on people who cannot protect themselves.

I am not willing to admit that oral prophylaxis or the cleaning of the teeth by the oral hygienist will do the profession any good. They do not know enough about pathology or the underlying structures to give competent advice. If they did, we might as well close every dental school and educate nothing but hygienists.

Why do we have these people? Why did they come? In the first place, the name is unfortunate, "dental hygienist," because the term hygienist in the medical profession covers ground for a greater knowledge than these people possess. A hygienist in the medical profession is a man with an M.D. degree, who has taken extra training in sanitation. These girls have had no such training. Some fellows gave it a name because it sounded well. They are not even dental nurses.

In Massachusetts, when the bill came up creating dental nurse and hygienist, representatives of the nurses' association appeared before the legislature and fought the bill, saying these girls were not nurses. The same thing happened in California less than a year ago. Some men decided in California they wanted a law licensing the dental nurse. The medical nurse did not want the term dental nurse. They fought that bill and changed the name. The bill was killed, anyway. It will probably be revived. The dental hygienist is not a nurse or a dentist. What is she? She is the result of conditions that arose in these dental clinics. Where did they start it? At the Forsyth and Eastman Institutes, and in the University of California, because by doing that these superintendents of infirmaries got a number of girls to study something. They said, "You become a dental hygienist; it is a wonderful field. We will license you." The girls fell for that. The license says you cannot do it except under the supervision of a dentist.

Now I believe in oral hygiene and prophylaxis, but it is too important for a half-instructed individual to undertake, whether male or female, and you cannot give proper training in nine months. It is a nice ornament to have a good-looking assistant in the office. If you are going to have that, have a dental assistant. A medical nurse has three years' training, which is thorough. She will not stand for a girl who has nine months' training, because it is unfair to the profession itself. You require men to study dentistry for four years, and yet here you expect an individual, after taking a nine months' course, to know more than the dentist does.

Let me cite one instance. In one city where they have a dental hygienist they pay her $80 a month, while the dentist in the public school draws $100 a month. He goes to a dental college for three or four years, and the girl, who takes a nine months' course, gets nearly the same salary as the dentist does. It is unfair, unsound, and one of the most illogical things ever brought out; still the profession is getting behind the movement and helping it along. I am very sorry to see the profession doing that. I am very glad to have the opportunity of speaking against this, and I shall have an editorial in the next issue of the *International Journal of Orthodontia and Oral Surgery* about it. A mistake does not make things right. What is the thing to do? One man said in an editorial in the *Dental Cosmos* last month, if you are not going to have a dental hygienist, what are you going to do? The dental hygienist will not supply the demand of the public. We have not enough dentists to-day. The thing to do is to make the dental profession attractive enough and make the public service count, so that more men will enter the dental profession and supply the needs. Instead of that, they are paying girls $80 a month, and the dentist who has studied three or four years $100. You are doing one thing and something else at the end, either raising dental education and the preliminary requirements of the dentist, or letting a species that do not belong anywhere practise oral hygiene. She is not a nurse, because a nurse will not associate with her. She is not a dentist, because she cannot practise without the supervision of a dentist. She is not a hygienist, because she has not taken as much training as a dentist, and she is simply a condition, a something that has been forced on the profession by a few fellows who have mercenary ideas, something by which they want to increase their incomes, something that will bring them a greater number of patients so that they can play more golf. (Laughter.) If you cannot take care of patients and give them the treatment to which they are entitled, you are certainly doing a shoddy thing to turn them over to a hygienist who knows little or nothing about dentistry, who has had a little training in polishing the surfaces of teeth, who is no more efficient than a manicurist who polishes finger nails and could polish teeth.

That is the situation as I see it to-day. What are you going to do about it? Are you going to ride on the popular side and yield everything to the dental hygienist, or are you going to meet the situation fairly and squarely? If you can convince me that you can take a girl and in nine months' training teach her to do something that it takes a dentist four years of training to do, you may as well close all the dental colleges and have nothing but hygienists. I thank you. (Applause.)

Dr. Hamilton (*closing the discussion*)—I am very much gratified at the amount of discussion that my paper has elicited. I did not wish to treat this matter of the hygienist from the standpoint of the general practitioner. That was hardly within the province of the paper. I have had a hygienist in my office for nearly three years, and I feel very well satisfied and would not care to give her up.

I will not attempt to answer all of the points that have been brought out, because many of them have already been answered by the different speakers who have taken part in the discussion. I made the statement that the hygienist received a thorough course. That depends perhaps on what we mean by a thorough course. From Dr. Dewey's standpoint perhaps it is not a thorough course, but, as one of the speakers pointed out, the hygienist is trained for one particular thing, to clean teeth, and nine months of intensive work of that one thing certainly ought to be considered fairly thorough. I did not want to create the impression that the hygienist could clean teeth better than the dentist. I said she will do this work more thoroughly and efficiently than the average dentist, and I think most of the men here will admit that. I did not say anything about her taking impressions; I said she could put together and prepare the impressions and run models, separate and carve them.

Dr. Dewey spoke of prophylactic fillings, saying that the hygienist could not put them in. I do not know what your experience has been, but I find the average filling is not a perfect prophylactic one. Frequently I find it necessary to reshape with a bur occlusal fillings in the molars to permit proper cusp relation. I think some of the objections that have been raised have been carried to an unwarranted extent. I do not think I have gone beyond the scope which the law lays down, simply the cleaning of the teeth.

There is one thing that has been brought out here, and that is that prophylaxis during orthodontic treatment is necessary. I do not think anyone who has practised very long will fail to admit that. If it is necessary, and we can turn it over to a hygienist, we conserve our time, and keep these youngsters from waiting, we have both gained.

The Scientific Side of the Manufacture of Dental Products, Involving the Question of the Co-operation of Dentist and Manufacturer*

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I WISH first of all to express my thanks to your essay committee for the honor they have done me in asking me to present a paper to the Canadian Dental Association upon this topic of their own selection which has always appealed strongly to my interest, because I am convinced that the problem which it involves is one of the elemental factors that lie at the root and origin of dental development and progress.

It is a complex question, one that has relation not only with all of our professional activities, but it also involves elements of human psychology expressed as attitudes of mind toward professional ethics, of altruism and of human selfishness as related to our ideals, our status and progressive development as a profession. It would therefore be presumptuous on my part, or indeed upon the part of anyone, to attempt a complete solution of all the intricacies of the case, so that I can only hope to direct your attention to some of its high lights and to so state the problem that we may perhaps establish a common ground of understanding, which, after all, is the essential starting point in all discussions which, like the one under consideration, involve diverse points of view.

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By the scientific side of the manufacture of dental products, I take it that we mean the application of scientific principles to the methods employed in the manufacture of dental products and likewise the use of the same principles in the prosecution of research investigations leading to the discovery of new methods or materials used in dental manufacture.

It is not necessary that I should discuss in any detail the obligation of industry as a whole to science for its past development or its present advancement. A single instance will serve to emphasize the fact that to science and the scientific method as applied to the arts and manufactures, humanity owes the largest debt of gratitude for the advancement of all that we imply by the term civilization. When Sir Henry Bessemer conceived the idea that by blowing cold air through molten cast iron the combustion of its contained carbon would generate sufficient heat to maintain the mass in a fluid state, while the carbon content was reduced to the point which would result in the production of steel, he hit upon a scientific principle that at the time was looked upon as the dream of a mad man, but after trials and disappointments the history of which reads like a romance, his efforts were crowned with success and the result was the greatest metallurgical discovery of the ages. The results which have flowed from the discovery of the Bessemer steel process have been infinite in variety and immeasurable in their importance. Railway and ocean transportation, the telegraph, the telephone, electric power generation and transmission, all the means for the rapid intercommunication of peoples, the advancement of the world's commerce,—in short the production of all the factors of civilization received their greatest impulse by reason of Bessemer's fundamental conception, and it is staggering to contemplate the chaos that would follow if to-day humanity was deprived of the use of Bessemer steel.

The promise of human betterment and of individual reward which the successful applications of science to industry hold out has stimulated scientific study in its relation to and in its connection with industrial activities to an extent that is now practically universal. Indeed, the fact that successful manufacturing is absolutely dependent not only upon precise technical methods but upon a scientific knowledge of the physical and chemical properties of the materials employed and their behavior under the conditions of manufacture and use, is so generally conceded that no industry of even moderate scope and dimensions is conducted without a scientific engineering department or without at least access to such a service.

The character and extent of the industry determines the scope of the field of scientific engineering upon which its successful operation depends. Where but a single product is manufactured, as in some of the metallurgical industries, the scientific problems presented for solution, while they may be large in the aggregate, are relatively limited as to kind or class. On the other hand, when the industrial output is varied in kind, the scientific engineering problems presented for solution are complex and vary over a wide field of scientific investigation. The manufacture of dental products is a typical example of the latter class of industry. So extensive and varied are the products utilized in dental practice that there seems to be no visible limit to the range of scientific problems that the manufacture of dental supplies presents. Indeed, it is difficult to particularize as to what are dental supplies, so that we are compelled to depend for a definition upon the general statement that dental supplies comprise everything a dentist uses in his practice. As one manufacturer, roughly speaking, is making in the neighborhood of some two thousand groups of items under the above general designation, and these do not cover the whole category, it will give some idea of the varied range of problems both scientific and practical with which the manufacturer of dental supplies is confronted. The problem is so greatly complicated by the variation in kind of the products that all successful manufacturers of dental supplies are compelled to maintain laboratories equipped with a scientific personnel covering a very wide range of specialized training in scientific research work, constituting a force that is expected to be competent to solve whatever problems of manufacture or research may arise. Modern practice in the manufacture of dental products is no longer empirical, but is almost universally the result of the application of the scientific method to the art of production.

It will doubtless be of interest to review briefly the extent and character of the contributions which the dental profession and the dental manufacturers have relatively made to the development of dental science and art which collectively have contributed to the advancement of dental practice. For the data comprising this phase of my paper, I am indebted to one who for thirty years has had unequalled opportunity and whose specialty it has been to study and record the sources from which new developments have arisen in dentistry, to assay their usefulness and to supervise their refinement to the point of production on a commercial scale. I feel that a general understanding of what the dental profession and the manufacturer have relatively contributed in the way of improvement in dental practice as the outgrowth of invention and discovery in what we broadly designate by the term "research" should have the beneficial effect of stimulating both the profession and the manufacturer toward more earnest effort and higher attainment in cooperative as well as in individual activities.

In operative technic the preponderance of accomplishment naturally lies with the profession. The accomplishment of the manufacturer in this field lies in the working out of special technic for apparatus, devices and materials which he has designed and produced. Some contributions of this kind from the manufacturer have been of great importance, the value of which should not be overlooked. In the field of Pathology and Therapeutics the advances have been made largely through the efforts of members of the dental profession. The profession is also entitled to the credit of having originated and perfected advances in Materia Medica, although it is a fact that some of the most valuable and widely known and used preparations had their origin and were perfected in the laboratories of manufacturing and pharmaceutical chemists.

In the special field of anesthetics, the manufacturer or the non-dental chemist has played a most important part. The discovery of Nitrous Oxid as an anesthetic, it is true, was made by a dentist, but the perfection of this gas as an anesthetic agent was accomplished by the manufacturer. Ethyl Chlorid was evolved not by a member of the dental profession, but by a commercial house. The same is true of Novocain and a number of other local anesthetics, which in their time were much in vogue. It is, however, true that some of the best known local anesthetic preparations were developed by members of the dental profession.

In chemistry (apart from medicinal and anesthetic preparations), the contribution has been almost wholly from the manufacturer. In dental cements, for instance, the big achievements have been attained through the efforts of the manufacturer. In the early days, and in fact, up to and within the last decade, the manufacturers of dental cements relied for their formulae upon certain dentists, who had devoted much of their lives to the study of dental cements. For the most part, these cements were not satisfactory, and the manufacturers were forced to employ chemical engineers and to equip laboratories especially for the purpose of carrying on research for the development and manufacture of dental cements of various kinds. As a result of this, the profession is now supplied with cements developed solely by the manufacturer, and which are immeasurably superior to the older cements developed by members of the profession.

While among the large variety of special waxes and various compounds, the formulation of certain outstanding preparations were accomplished by dentists, the majority of these compounds were developed by the manufacturer. Credit to the late Dr. G. V. Black is due for the greatest single achievement in alloys for filling teeth, but the fact must not be overlooked that the perfection of these alloys and the methods of their manufacture have been accomplished by the manufacturer. The manufacturer is far in the lead on dental rubbers, splendid advances having been made in the past few years.

Operative instruments, such as excavators, chisels, etc., which do not involve engineering problems, are for most part devised by members of the profession. An operative instrument is so personally related to the dentist, being, in a sense, almost a part of him, that he is best able to say how these instruments should be fashioned. Hence, most of the instruments that have been used in dentistry have the names of dentists attached to them; the dentist either having submitted to the manufacturer the patterns which he has designed or explained his peculiar needs to the manufacturer. No one has done more in this particular field than the late Dr. G. V. Black.

Drawing a clear line of demarcation between those instruments or tools which do not involve engineering problems and those which do involve such problems, it has rested with the manufacturer to make large contributions in this latter class of tools. By way of illustration, we have but to think of the one great outstanding achievement in excavating burs, to wit, the "Revelation Bur," which overshadows all other advances that have been made in this most essential and widely used tool. Here there was a real engineering problem to solve. Various forms of burs had been devised by dentists as well as by manufacturers and tried out by the profession, but it was the "Revelation Bur" with its peculiar cut or formation of blades that solved the problem, and now practically every excavating bur is more or less an imitation of the "Revelation."

In Prosthetic Dentistry the honors may be equally divided with perhaps the profession slightly in the lead. Most of the more widely used articulators have been invented by dentists. On the other hand, the best known vulcanizers were devised by the manufacturer, who also refined and perfected most of the prosthetic devices that have been in the hands of the profession.

In Orthodontia, practically all appliances have been invented by members of the profession. The manufacturer, however, has refined them and designed and built machines for producing them.

While in the all-important field of artificial teeth, the profession has made occasional valuable contributions, it has been the manufacturer who has contributed most largely. In no field of dentistry has there been so much activity among the individual members of the profession as in artificial teeth. There is, and for a long time has been, a vertible craze for inventing teeth, particularly those of the interchangeable variety. Of the great number of artificial tooth inventions, most of them are but mere repetitions or slight modifications of old forms, while many of them are wholly impracticable and valueless.

Perhaps in no field of dentistry has the manufacturer done more real constructive work with the least assistance from the profession than in the Dental Office and College Equipment, including chairs, engines, spittoons, bracket tables, etc. The explanation of this is that these things involve engineering problems, which, as a rule, can only be solved by mechanical engineers. Without overlooking the important contributions of Drs. Morrison and Wilkerson, the dental chairs now in use were developed by the manufacturer; specially trained chair experts and mechanical engineers being employed for this purpose. The so-called "Unit" or equipment stand which found such ready acceptance by the profession had its inception with and was developed by the manufacturer. The same is largely true of dental engines, handpieces, anglepieces, fountain spittoons and the numerous other things entering into the make-up of the dental office equipment.

As great as have been the achievements of the manufacturer in the designing and perfecting of dental apparatus, tools and materials, even greater, perhaps, have been the manufacturer's achievements in the designing and building of the special machinery by which these articles are made. The profession seeing and handling these articles can understand and appreciate what these articles and contributions of the manufacturer mean, but the machinery employed for producing them, the profession does not see and knows little or nothing about, for they are hidden away in factories and laboratories which are but seldom visited by only a few dentists. Here, however, mostly unknown to or unthought of by the profession, the manufacturer has done some of his best work, has put forth his greatest efforts and achieved his greatest successes.

The rivalry between manufacturers to provide superior products each with the underlying motive of keeping himself in the forefront of the business is most active and results in the profession being furnished with superior supplies, which enables it to more conveniently, profitably and expeditiously perform its work and at the same time add to the comfort of the patient.

The subject of dental research and invention, the devising and perfection of new and improved apparatus, tools and materials for the use of the dental profession should not be considered without some reference to the necessity of protecting the things developed, which may be afforded either by secrecy or by patents. It having been demonstrated through a long course of years beyond peradventure of a doubt that our patent system has been the one great vitalizing factor in stimulating the marvelous growth of this country's manufacturing industries, the importance and necessity for providing the manufacturer with protection, at least for a limited period, must be admitted.

The novel things which the manufacturer develops through the instrumentality of his human and physical equipment, and his lavish expenditure of money and likewise the things which he acquires by purchase from the individual dentist, can be more or less adequately protected by patenting the things which he sells and by keeping secret or patenting the manufacturing machines, processes and formulae. It is because of this protection, which is essential to the industry, that the manufacturer feels justified in putting forth the necessary effort and providing the necessary funds.

With the profession as a whole or any section of it, or any group of dentists as distinguished from the individual dentist, means must be found for producing for the use of the profession any material results arising from this concerted professional effort. Of necessity, this means of producing must be a manufacturer. Having by concerted effort, presumably under the auspices of a general or national association, a state or city society, or a special organization or group, developed a new and useful apparatus, tool or material, the profession, or at least that part of it responsible for this particular achievement, is confronted with the problem of allocating it to a manufacturer or manufacturers. Of course, the profession can dedicate the results of its efforts to the public by placing it before all the manufacturers, leaving any or all of them to manufacture it if they see fit to do so, or the profession can endeavor to make a special arrangement with one particular manufacturer. In the latter case, the new thing must be protected to make it worth while for the manufacturer to invest the capital to provide the necessary equipment for manufacturing the article. In the former case, there is no incentive for the manufacturer to undertake it because he knows that all the other manufacturers can make it if they so desire.

Herein lies a wide difference between concerted professional action on the one hand and action of the individual manufacturer and the individual dentist on the other. Until some means are found to adjust this serious difference, until proper means are found for producing what has been developed, research carried on by the profession collectively cannot possibly attain the success it should achieve. Yet it is obviously of the utmost importance that the profession make greater effort than it has heretofore done to advance dental research. Hence, the necessity for working out some plan whereby the results of the united effort of the profession and the manufacturer can be utilized to the best advantage.

It is evident that there is a growing recognition by the dental profession of the importance of scientific research as related to the improvement of its service and a corresponding feeling that the desired results would be more quickly and practically attained by some plan which would coordinate the research activities of the dental profession and the manufacturers respectively. The fact that you have invited me to discuss this subject with you is evidence of such a growing state of mind as I have referred to.

Historically the growth of appreciative recognition of the importance of the research factor in dentistry is interesting. I think the motif of scientific investigation in dentistry may be said to have had its inception in connection with the investigation of the causation of dental caries. Leber and Rottenstein, Milles and Underwood, Vignal, Legros, Magitot, and their co-laborers who prepared the way for W. D. Miller's epoch-making work gave practical emphasis to the scientific method as the only sure way to the solution of our material professional problems. In the United States a decided impulse was given to the interest in dental research by a paper read before the Dental Society of the State of New York at its annual meeting in 1906 by Dr. G. V. Black, himself a trained scientist, entitled "Consideration of Evidence in Scientific Investigation" in which paper a clear distinction was made by the essayist between purely speculative guesswork and rational inductive, scientific reasoning with emphasis strongly placed upon the productiveness and relative certainty of the latter.

The effect produced by Dr. Black's paper was noticeably impressive so much so that the society at once took steps to create a committee on Dental Research and to provide a substantial fund for its prosecution. The example thus created has been, I believe, the stimulus which has developed a number of such activities in dental societies, among others the National Research Institute of the National Dental Association at Cleveland, Ohio, and your own research organization. The productiveness of these various research centers is, in my opinion, handicapped insofar as the problems under consideration are those relating to dental supplies by lack of cooperation between these professional research centers and the engineering and research departments of the manufacturers of dental supplies. The situation thus created has the serious disadvantage of division of effort and duplication, often multiplication, of work, disadvantages which in these modern days of intense practicality and high efficiency are regarded as a form of economic immorality. In the light of past professional attitudes of mind and the ethical standards inherited from our professional forbears, it is difficult to see how without sacrifice of some elements of professional sentiment a cooperative relation could be brought about between the two sources of dental research activity now separately conducted by the profession and the manufacturer respectively.

To those wedded to the ethical idols of the past the thing is impossible, yet as evidence that we are as a matter of fact living under a new dispensation of revelation of the truth, that the world is in fact being remade in an ethical as well as in a material sense, it is interesting to note that in the important field of anesthesia the impossible has happened in the formation in 1919 of the National Anesthesia Research Society, an organization composed of anesthetists and specialists in anesthetic research work with the addition to its membership of manufacturers of anesthetics and anesthesia apparatus.

This combination of professional and commercial elements has been found to work most harmoniously and in the brief period of two years since its formation the society has not only brought out in its bulletins much original matter bearing upon the subject of its interest but has done much to stimulate a general interest in the scientific study and use of anesthetics in medicine, surgery and dentistry. The membership has largely increased and covers a majority of the several states of the Union.

As this single example of co-operative effort between the profession and the manufacturer gives encouraging promise of a successful career, there appears to be no reason other than that of questionable sentiment why similar effective co-operative activities related to the other important features of dental practice should not be instituted. That there is much need for such co-operation cannot be successfully denied.

One of the most important and crying needs of the dental profession, as well as of the manufacturer, is an official standardization of operative dental technique that will eliminate the disharmonies now so manifest in our operative methods and a revision of our educational methods on the basis of a standardized system. Surely, when the United States Government was obliged to buy one selection of outfit to treat the teeth of its soldiers and a different outfit to treat the teeth of its sailors, because the dental authorities in the case were out of agreement as to operative technique, it is time that dental teachers composed their differences and agreed upon a common standard. In closing this desultory paper, let me direct your attention to one important fact, and that is, that dental research, like all research, is successful only in proportion to the spirit which prompts it. If the motive is wholly selfish the results will more than likely be found to be contaminated by error or by intellectual dishonesty, which has always been the short cut to the selfish man's goal. Not all men are mentally, morally or temperamentally equipped for research work. If it be true that "poets are born, not made," the same holds true of the scientific research worker who, in an ideal sense, has consecrated his life and powers to the interpretation of the truths of nature into terms of human understanding. These men work by inspiration, and the truth as it reveals itself to them is their reward and compensation. Needless to say, they are rare, but when men cast in such a mould are happily found in dentistry the profession can do itself no greater or fruitful service than to relieve them of all financial concern, and so place them that they may pursue their work unhampered by disturbing pecuniary considerations. Finally, it must be noted that specialization is as much a characteristic of scientific research as it is of every other field of human activity. Nature is limitless; the human mind functions within a relatively narrow groove, and each of us is temperamentally adapted usually to but one field of activity. Pope has well said:

"One science only will one genius fit,
So vast is Art, so narrow human wit."

In times past the village doctor, being the local oracle, either by his own estimate, by common consent, or both, was consulted upon every subject embraced within the ken of man, and his advice was taken seriously. Now the public has learned the practical importance of the knowledge gained by special training; hence the village doctor, while valued for his special knowledge, has ceased to be regarded seriously as a compendium of universal knowledge. All of which bears upon the fact that dental research, to be successful and practically useful in extending the range and efficiency of dental service to humanity, must be conducted by specialists, and always by or in co-operation with those dentally trained and who have acquired by experience a sympathetic, detailed understanding of the extent and character of service which it is the function of the dental profession to render to humanity.

DISCUSSION OF DR. KIRK'S PAPER.

The PRESIDENT: We are under obligation to Dr. Kirk for his unique and unusual presentation of a subject like this before a dental convention. I am sure that there will be an animated discussion on the subject. I will ask Dr. Nolin to open the discussion.

Dr. NOLIN: Mr. Chairman and gentlemen: My good friend, Dean Dubeau, was on the programme to open the discussion on Dr. Kirk's paper, but at the last moment he had to leave and I was asked to take his place. Handicapped as I am by possessing only a limited knowledge of your beautiful language, I hesitated at first, but upon reflection I accepted, feeling that I could not shirk a duty or become a slacker.

I have not seen Dr. Kirk's paper: I have heard it now for the first time. But what strikes me most in Dr. Kirk's very able essay is his last affirmation about the standardization of operative technique. From a manufacturer's standpoint, his point is indeed well taken; from a scientific standpoint, from a dental standpoint, from a professional standpoint, however, I would like to take issue with him.

If there comes a day when professional teaching shall be standardized; when every teacher of, say, operative dentistry will limit himself to the teaching of principles which are accepted by every other teacher, on that day the progress of dental teaching will have stopped. Progress in science is the result of individual effort and individual research; it is completely personal. I believe, therefore, that it would be wrong to over-standardize teaching; to over-standardize professional callings.

If we look backward and ask ourselves what effect the efforts of dental manufacturers have had on the progress of the profession, we must acknowledge that both good and bad results have been brought about. In the early days of the profession it is undeniable that some dental manufacturers helped considerably in the progress of the profession. As time went on; as efforts multiplied; as dental schools were organized, the efforts of the profession towards progress became more collective, if I may use the word. Groups began to form; ideas were compared, and the profession began to stand on its own feet. But as the members of the profession became more numerous, dental manufacturers became more lucrative; and there came a day when some of us asked ourselves whether the dentist was dealing with the public or whether the manufacturer was dealing with the public through the dentists. Now, Mr. Chairman, I say this without any idea of offering adverse criticism; if anyone is to be criticized in this respect, it is more the dental profession than the dental manufacturers.

A few days ago I went into the office of one of my ex-students, a very clever chap. I found him with a very beautiful office,—at least, a most expensively equipped office; I take back the word "beautiful." He had a six or seven hundred dollar chair; a twelve hundred dollar unit of some kind, and a six hundred dollar cabinet. In looking around his office I was curious enough to open some of the drawers of the cabinet. I saw there, three or four broaches; half a dozen excavators—some broken—but very few practical instruments; yet that boy had an office on which he had spent, perhaps, three or four thousand dollars. I agree with Dr. Kirk that the members of the dental profession and the manufacturer should get together with a view to bringing about the solution of some scientific and economic problems which are before them. The day has arrived, I believe, when we must recognize the fact that too much importance has been given to what I might call commercial equipments and too little to really scientific equipment.

Dr. Kirk spoke about patents. He says, and justly so, that a manufacturer who undertakes the manufacture of expensive apparatus must be protected. With that I agree, to a certain point. He would like the profession, either collectively or each individual acting for himself, to carry on research work to help the manufacturer. There was a time some years ago when every other dentist made the pretension that he could invent some new thing. Once in a while a useful invention was brought out by some dentist, and it was the condition then that that dentist could get a patent on his invention and derive some benefit from it. But in modern times the profession has decided that it would be unethical for the dentists to do any such thing—and rightly so; for a scientific discovery should be for the advantage of all the profession; the really scientific man should be satisfied with the glory of helping his profession and helping humanity. But on the other side the result has been that individual efforts have diminished and that inventing has been left almost entirely to the manufacturer.

Now, some manufacturers, including the very well known and very important company with whom Dr. Kirk is connected, have seen the light and have undertaken research work in the interests of dental progress; and men of Dr. Kirk's wide talents and great knowledge have devoted themselves to this work. In my opinion that is a step in the right direction. Dr. Kirk has left the practice of dentistry and dental teaching to enter into industry; perhaps I may venture to ask him to make a few suggestions to the dental manufacturers.

I told Dr. Kirk privately this morning that there is still much room for progress in the matter of dental supplies and equipment. We are now buying chairs and units and cabinets at extraordinary prices. But it is not the price that I want to criticize. My criticism is directed against the appearance of the very expensive apparatus which you see in the average professional man's office. Would it not be possible to give at least some kind of artistic appearance to all these very expensive things? A patient of mine, an American—we in Canada occasionally happen to have an American patient—visited some time ago the Chamber of Horrors at Sing Sing, that place where they electrocute people who have not been good. He came to my office, which is an old office, I must acknowledge, very poorly equipped. He said: "Well, this is a comfort." I said: "How is that?" "Well," he said, "I like to see a dental office which is furnished something like a private room; most dental offices remind me of the electrocution chamber at Sing Sing, with all this apparatus hanging from the ceiling, with these chairs full of nickel, with these square-faced cabinets, and, withal, the emptiness of the room." This is not a scientific aspect of the question, but it is a practical phase of it, and the manufacturers could, I think, improve the general lines and appearance of dental furniture.

From a purely manufacturing point of view, the question might well be asked: Is progress being made in all lines? Some years ago we had a chair called the Wickerson chair. That chair was so disposed that a patient could be supported from head to foot in a supine position, as on a surgical table. Well, that chair has gone out of manufacture; it can no longer be bought, and if any of us have to resort to an anaesthetic with ether or chloroform, we are told by the medical man that he would like the patient to be operated upon in his own office on a surgical chair. How is it that to-day we cannot get such a chair, though we pay three times as much for the chairs as we did some years ago? It seems to me that in this respect we have retrogressed instead of progressed.

In connection with the manufacture of operating instruments I fully agree with Dr. Kirk when he says that the variety of taste among dentists certainly retards progress. The number of instruments actually necessary for operative dentistry is limited to a few; and everybody should be able to get what he needs from among those few.

Mr. Chairman, I am sorry that lack of preparation prevents me from discussing this paper as it should be discussed. I will conclude by joining in offering our sincere thanks and congratulations to Dr. Kirk and expressing the pleasure we have had in listening to him and meeting him again.

The PRESIDENT: We shall be glad to have this discussion continued. I am sure that Dr. Nolin has done his duty nobly, considering the short time he has had for preparation; he has presented some phases of the question that are of great interest. Is there any further discussion?

Dr. SPARKS (Kingston): I am glad to see that the manufacturers are eliminating the finely-grooved serrations on the handles of operating instruments and are getting down to a smooth handle. It has been very hard to keep the serrated handles from rusting.

Dr. KIRK: Mr. President and gentlemen, I want to thank you—and especially do I wish to thank the President—for the courteous and attentive hearing that has been given to my talk. There is a point that I did not bring out in my paper but which I can refer to now in the light of the discussion by Dr. Nolin,—that is, the attitude of the manufacturer toward these problems. The manufacturer is constantly being criticized for not doing this or that, or for doing some other thing. Let me say that the type of criticism that is constructive in character, such as we have had from the gentleman who opened the discussion, is not only welcome, but is earnestly sought by the manufacturers. We have endeavoured to gather about us,—not in an official way, but in a friendly co-operative way—a considerable number of professional men who are interested in the kind of problems with which we are concerned and to whom we can go for criticism. It has been part of my function during the past two or three years to get into contact with and seek the criticism and advice of such men.

It is surprising how strongly a habit fixes itself upon the mind and how difficult it is to change a method or line of thought in the slightest particular. The question of instrument handles has been referred to. I suppose those of you who shave yourselves have become wedded to a particular type of razor and nothing but a general cataclysm of some sort could induce you to change that razor. Doubtless the same applies to your pen knife or to your fountain pen. I know from my own experience that I am a creature of habit in that respect. We have had as much trouble over the question of the instrument handle as if it involved membership in the League of Nations. After consultation with experts, and after talking the matter over with thoughtful, conservative men, we finally decide upon a change, and the new form of handle is issued. Then the cry comes up from various members of the dental profession: "Why didn't you do it this way? Why didn't you do it that way? Why didn't you do it some other way?" And out of all this medley of opinion we have tried to solve the question upon the basis of the view of the majority and of the greatest good to the greatest number.

Only a short time ago, at Hot Springs, Virginia, I ran across an old friend of my college days. He seized me by the arm, got me into a corner, formed a hollow square around me so that I could not get out, and proceeded to tell me why he "had it in" for the Company with which I was connected because they had ceased to manufacture a certain type of excavator. "What do you mean, anyhow?" he said. "Why do you put yourselves in the position of dictating to the dental profession what the dental profession shall or shall not use?" I said, "I do not admit we do that, but at any rate, why do you think we do?" "Well," he said, "I have tried to get a certain type of excavator, and I cannot get it." I said: "The answer to your question as to 'dictation' is that 'ninety-nine and forty-four one hundredths' of the dental profession are demanding Black's instruments. You and I are back numbers; we belong to the past; we learned other methods. But the dental profession to-day are using and demanding a different class of instrument. We know that to be true by the records of manufacture and sale that very clearly indicate what it is that they want. Now you are in effect asking that we stop manufacturing those instruments which are so largely in demand, that we take skilled labor off the job of supplying the dental profession with the things we cannot make fast enough to meet the general demand and put them on the little job of making half a dozen or a dozen of these instruments for you, and delay the service of the majority by just that much.". It would seem that it is a simpler and less costly procedure for one man to learn to use the Black excavators than to hold up the service of the general profession in order to manufacture instruments specially for him or the small minority that he represents. It is the dental profession which dictates our policy of service, not the manufacturer.

Dr. NOLIN: Do you not believe that in times past when small manufacturers were willing to do small jobs for individual dentists, the personal effort thus induced on the part of the dentist made for the better progress of the profession?

Dr. KIRK: In those times that Dr. Nolin speaks of, the dental profession was not as large as it is now. The profession and the manufacture have grown pari passu; they have developed together. Take, for example, the conditions that prevailed during the late war, when not only our own factory, but, I suppose the factories of all dental manufacturers in the United States, were running overtime. We were running twenty-two hours out of twenty-four,—allowing just time enough for the machines to cool down and to enable the men to get something to eat,—all in an effort to supply what the United States Government required and what we were able to give to the civilian population. So with that kind of strain put upon the productive side of the industry it is a serious matter for the dental manufacturer to supply individual types of instruments to those who happen to be wedded to an idol.

This brings me to the other and related point brought out by Dr. Nolin, and it is a very important one. He was quite right in raising an objection to absolute standardization. I object to that just as strongly as he does. I recognize in his remarks an indication of one characteristic quality of the French race. One thing that glorifies France to-day is her individualized manufacture; she puts something of her personal and individual soul into her products,—a condition which, in America, is reduced by the requirements and quantity production to a soulless mechanical process. Undoubtedly, progress and variation go together. But it is also true that the great bulk of supplies must be made in large quantities,—and when I speak of standardization I do not mean absolute standardization in the sense of eliminating individualism. While I was connected with the Council of National Defence in Washington I went over the catalogues of the various manufacturers with a view to selecting a standard instrument outfit for the Army and for the Navy, and I was astounded to find that there were no less than fifteen or eighteen different kinds of chip-blowers, to blow the chips out of the cavity. These different types all had to be manufactured because there were fifteen or eighteen different groups of men who wanted individualized types of chip-blowers.

Now, I put it to you as a fair question: Would it not be possible for the dental profession as a whole to take these fifteen or eighteen types of chip-blowers and apply some principle of standardization that would meet all reasonable requirements? Why this great number of types of chip-blowers for the simple process of blowing debris out of a cavity? As you multiply these things you multiply costs and you limit production. I went recently through the various dental hospitals in England, and most of the men I met who were experts in the extracting of teeth laid emphasis on the fact that they were quite able to extract every tooth in the human mouth—except those cases of impacted teeth; special cases—with three or four forceps; yet one manufacturer is compelled to keep in stock something like two hundred forms of extracting forceps to supply individual demands! It would take a man with a brain like a card-index to tell what particular kind of forceps he should select for a given extraction if he had that many to choose from. So you see, we run to extremes in that way. It is a rational standardization that I am interested in.

I would like to say one word also—because I did not elaborate on it in the paper—with regard to the question of patents, which has been referred to by Dr. Nolin. I fully recognize that an ethical consideration is involved. I am a professional man, I was raised in the atmosphere of the profession, and I have been just as strongly imbued with the professional faith as any of you here; in fact, I have helped to build it up. I have invented several things which to-day bear the names of other men. I had one manufacturer serve notice on me that I had no right to use in the dental school with which I was connected a certain device I myself had invented and lectured on,—one of my students had taken out a patent on it in the meantime, after learning of it from me, and sold it to a manufacturer who was exploiting the device commercially. So I have had something to do with invention.

I am not the author of that statement referred to by Dr. Nolin, which is quoted in my paper; I merely quoted from a man who had a great deal of contact with the question of professional patents. It is true that in the commercial production of any device the manufacturer must have some means of protection. The late Samuel S. White told me that in the production of the first cable engine, he expended over $50,000 before he put the first one on the market. Now, that was not for the buying of the patents; that was for the development of the device and the refining of it; the making of the tools necessary to its manufacture—he had expended in cash over $50,000 before the first engine was offered for sale on the salesroom floor. Very well; after that engine came out a replica of it was made by another manufacturer which cost that manufacturer nothing. The point, then, is that the manufacturer must have some means of protection in order to get back the original expenditure of money that he made in producing the thing. I wonder if you could possibly understand—I could not until I got in contact with the work—how much of the time of many valuable men it takes to bring to the point of effective manufacture an idea, an invention, that is presented in its first crude state, for production by the manufacturer. It is remarkable the amount of time, energy and hard cash that are spent in developing these ideas to the point of manufacturing. They come in very crudely expressed; often they are the ideas of men who are dreamers—God bless them; for we cannot get along without them—but they are seldom submitted in a perfected condition ready for production and it takes a great deal of time and money to do that. So the manufacturer must have some protection in his effort to bring that invention to a point where the profession, broadly speaking, can get the benefit of it. The dental profession is a very large body, and the amount of material they use in their practice is enormous. When any new invention comes out a very large number of dentists will want it, so it must be produced in quantities; otherwise it cannot be produced cheaply.

Perhaps I have talked too much, but I would like to leave this thought with you: While the problem which I have presented is an extremely complex and intricate one and involves many points that are debatable, both in economics and in ethics, the fundamental fact is that the dental profession and the dental manufacturer are inextricably bound together so far as their interests are concerned. They are both in the service of humanity. Th dental profession is serving humanity in the most important phase of its need, that is, its health need. The dental manufacturer is serving humanity in the same way, through the instrumentality of the dental profession. That is the way the manufacturer looks at it; we are purveyors to the dental profession, and we must see to it that the dental profession gets what it wants, and that it gets it in sufficient quantities and of the very best possible character and quality. There is, as Dr. Nolin has stated, the artistic side of it. It is quite true that some of the equipment which is furnished to dental offices is monstrous from the artistic standpoint; and yet there are among the dental profession a considerable majority who will have just that kind of monstrosity and nothing else. That is what they demand, and if they do not get it, then there is another source of trouble.

So, fundamentally, it is a question of education, and to that end let me urge you to submit, either collectively or individually, to the manufacturer whatever ideas you may have, whatever criticisms you desire to offer. Let us get at them; let us get together and talk things over and see if we cannot, collectively or co-operatively, bring about a more satisfactory state of things which will eventuate in a larger and more dignified and effective service to humanity.

President's Address, Canadian Dental Association

FRANK WOODBURY, D.D.S., LL.D., HALIFAX, N.S.

THIS is our first Convention since the establishment of Peace. We welcome the ladies, and our brethren from the United States, who are with us as guests, lecturers and clinicians. We do this with peculiar pleasure, because on the occasion of our last meeting in 1918 we were guests of the National Association of the United States. It was a time of Stress and War.

We remember with warmth of heart the gracious brotherly feeling which prompted the invitation and prompted us to accept it.

We welcome to-day: Our clinicians from abroad, Dr. Clarence Grieves, Baltimore College of Dental Surgeons; Dr. T. Sydney Smith, San Francisco; Dr. Clyde Davis, Lincoln, Nebraska; Dr. E. C. Kirk, of Philadelphia, and the men who have kindly consented to give papers and clinics from Canada.

We welcome the men representing every province in our broad land.

You will learn with regret of the death of a member of the Executive Committee, Dr. L. De Guise, of Montreal. Dr. De Guise was a member of the staff of the Dental Faculty of Laval Dental School. A man of great promise. The Committee on Necrology will present suitable resolutions of regret and condolence. Dr. Charron, of Montreal, was appointed to fill the vacancy.

When our last meeting was held, Dentistry was mobilized for War, and charged with a very important mission. War surgery and war pathology was about all we could think about. Now peace has come and we are beginning to breathe more freely and settle down to apply to civilization some of the things that have been learned. It is not my purpose to speak further of this. I want, however, to welcome back the splendid men who sacrificed practice and home, and risked health and life and went overseas. Men, we welcome you back.

From the nature of your work there were but few casualties, but there were some. I hope this National Association will suitably express by resolution their sympathy and sorrow, and order it published in the Dental Journals.

This meeting marks an epoch in the history of the Canadian Dental Association, inasmuch as we shall put into effect our new constitution which is designed to change us from a loosely organized body which performed a doubtful function between Conventions, to a carefully organized living Association which is calculated to touch the dental interests of our whole Dominion in a practical way, throughout the year.

Standing at this point, the pioneers, who have worked and prayed, sometimes under great discouragement, but with dogged persistence, look ahead with confidence feeling that foundations sure and strong have been laid, upon which a lasting structure will be built. We pass it on to you young men, knowing that the meeting at Ottawa, 1920, will always be a land mark and a new starting point.

We recommend that the by-laws be adopted at the earliest possible moment and submitted to a strong Committee to work out the details of organization and have the machinery in smooth working order before the close of the Convention.

It is not necessary that I should more than touch upon some of the activities in Canada that are of great significance to the profession and public.

CANADIAN ORAL PROPHYLACTIC ASSOCIATION.—The vision and optimism that created this corporation, the altruism which has characterized its policy, and the immense public good which it has achieved are matters of pride to the whole Dominion. Without it much of the public work already accomplished, could not have been performed. This Corporation has consented to act as Educational Committee for the Canadian Dental Association for a number of years. We could not have performed anything like the same good had our Association formed an independent Committee on Oral Hygiene and Education. The report of this Committee will be of great interest.

We must all be gratified with the prospectus of activities just published, into which the Canadian Oral Prophylactic Association is proposing to labor.

RESEARCH.—At the last meeting of this Association, the Committee on Research was organized and regulations for its operation were adopted. The Royal College of Dental Surgeons and the students of the Dental School in Toronto have taken great interest in it and raised funds which now amount to several thousand dollars, for the carrying on of its work. Little has been done outside Ontario. This is largely, we believe, because the work of the Research Committee has not been sufficiently known. If it has been apathy and lack of interest, it is inexcusable. If from lack of real knowledge, it is pardonable—but after the presentation of the report, and the aims of the Research Foundation are placed before you, I hope that an active campaign should be inaugurated.

Every man should be present when this report is presented. There is no reason why every one of the Dental Schools of Canada should not be centres of research under the guidance of this Foundation.

Indeed they ought to be. It will take time, but it must come. It will take money, but we must provide it. There can be no work in which we can invest our interest and shekel to bring greater return in increased knowledge and greater appreciation of what is demanded of us.

DENTAL EDUCATION.—Each year marks advances in Dental Education.

The Canadian Schools have for many years conducted the four years' course before graduation, based upon University matriculation in Arts. In this Canada has led the Continent by some 15 or more years. In January last, The Dental Faculties Association of Canada was organized in Toronto. Representatives of each of the four schools were present, and a schedule of suggestions was drawn up and agreed upon for presentation to the various Educational Institutions involved. Unanimity marked the deliberation.

The following questions were discussed:

1. The matriculation standards and regulations upon which students may be admitted.
2. The terms upon which students may be exchanged or transferred.
3. Treatment of expelled students.
4. Fees.
5. The addition of an extra year of preparation before undertaking the four year course in dentistry, called the Pre-dental Year.

Some of these have been definitely adopted already, and it is hoped that at a meeting to be held during this Convention, an understanding may be reached upon all points.

As the years pass and the importance of dentistry in the preservation of the health of the world is being recognized, and the larger responsibility is being placed upon the profession, the necessity of better preparation becomes more apparent. Better preliminary education must be required if we are to keep step and continue to merit the confidence of the public.

Any man who is engaged in dental education knows by observation that, everything else being equal, junior matriculation in Arts is not a sufficiently broad foundation upon which to erect a professional career.

It is not too early to introduce another year of preliminary education for dental students in Canada. The student needs the added mental development. He needs the added outlook on literature and the development of higher tastes. He needs it in order that he may be able to grasp in any great way, the professional subjects with which he is called upon to grapple in his training, and above all, he needs it that he may better serve his community professionally and as a citizen.

The pre-dental year is really a necessity. It will give the student a year in English literature. A year in drawing and modeling. It will dispose of his biology, physics, and part of his chemistry and will give him a year in French.

Nearly all present were graduated on a much lower minimum preliminary requirement. It will be all the more to our credit if we say, as we know we should, "Another year must be added to the requirements for entrance into the Dental Schools of Canada." I hope this Association will endorse this movement on the part of the colleges, and pass a recommendation to that effect.

Last year the Dental Schools were taxed to their utmost capacity with students and in each one plans are now being made for enlargement. The increased interest which is being taken by the general medical profession in the lesions and infections of the mouth and the panic into which the public has been thrown, has increased the demand for dental services far beyond the capacity of the present graduates to supply. Thus many young men are now seeing in dentistry an opportunity for a vocation and a most worthy one. No doubt but that our Schools will all have large Freshman classes during the coming session.

Post Graduate Schools are being held in various parts of the Dominion, some under the auspices of the Dental Schools and some by Provincial or Local Associations. These are of immense value to the practitioners throughout the country.

LEGISLATION.—We have some excellent Dental laws in Canada, and many excellent features in all of them, but at the present time there is a tendency on the part of many in our Legislatures to advocate a lower standard of qualification for the dental practitioner, and in some cases to allow unqualified men to practice on the living patient.

This Association can be of great value to the Provincial Associations by making a statement respecting the necessity of maintaining high qualifications for dental practitioners.

I strongly recommend that the Committee on legislation which is to be formed, make it their business to formulate a pronouncement respecting this matter in ample time to be used by any Province needing help, at the coming sessions of the Provincial Parliaments. Indeed that Committee can be of great service to the Provincial Boards by securing the best and latest information respecting the attitude of legislatures, and the various parties competing for power in our Dominion.

SPECIALIZATION.—I now desire to speak of Specialization in Dentistry. We have already the Orthodontist, Periodontist, Exodontist, Prosthodontist, the Radiologist, the Oral Hygienist, and the Crown and Bridge Specialist, etc.

If all were employed in a given mouth, the general practitioner would be simply a cobbler of carious teeth and pulp canals. I have heard of no one craving the distinction of being a specialist in this latter doubtful branch of dental practice.

No one denies the privilege of any one to practice any phase of the healing art that appeals to him, but the dental specialist is largely operating on the better class of patients of the general practitioner, and operating in the field that has perhaps been his care for years, and there *must* be a reasonable ethical relation between them. I have not seen any pronouncement by any Association as to the ethical relations that should exist between the family dentist and the specialist; between the public and the specialist; between the medical profession and the dental specialist.

My purpose in presenting this subject is to have the air cleared by a definite statement of opinion as to the ethics of the situation, from this Association. It is one of our functions to set standards. I hereby recommend the appointment of a strong and thoughtful committee who shall present to this Convention a resolution concerning the ethical relation of the specialist to the dental and medical profession and to the public, and the proper attitude of the public toward the general practitioner and the specialist, as well as the question of commissions and rebates. This recommendation, of course, does not affect in any way, the many men who are now ethical, and working the Golden Rule, who I am sure will welcome a pronouncement upon it.

PUBLIC HEALTH.—The importance of the care of the teeth is being recognized throughout Canada in a very practical way.

It is no intention of mine to infringe upon the domain of our essayists on this important subject. It will come up for discussion in its regular place in the program. Suffice it to say that not only the school dental clinic is being undertaken in the towns and cities of our land, but most helpful and valuable rural itinerant clinics are being established in some parts of the Dominion, which should be multiplied many fold.

The Pre-school Dental Clinic is being considered as a practical institution reaching as far back as the training of mothers in relation to the development of the teeth under pre-natal conditions, and making every effort to assist in preserving the temporary teeth in usefulness and comfort until school age.

It is hoped that resolutions of a constructive character may be submitted upon the various questions now mentioned and those discussed in formal papers at this Convention, that are of public interest, and put this Association squarely back of the profession.

Never before has the profession had such an opportunity to show itself worthy of the claims we make for it.

Never before was there such need for cultured men devoted to the *science* of dentistry as now.

Never before did the world need so much *men*, altruistic men, God-fearing men, men with National and Imperial vision in their work.

We have great opportunities. Let us, like men with vision, men with purpose, carry on.

A few years ago, I saw the following statement in a dental advertisement in a local paper in the West Indies.

"The Dental Surgeon to be successful must have
the insight of a Scientist,
the skill of the Surgeon,
the heart of a Mother, and
the touch of an Angel."

Gentlemen, these are your qualifications. See that the ideal is reached. We have much and serious work to do in the next few days. The dental men in Ottawa have done everything to make our stay in the Capitol a joy, and the local committees have provided every facility for the prompt despatch of business.

Let us undertake the task before us in a Statesman-like way. Let nothing small hide the large—but with the good nature born of high purpose, let us proceed with the work of the hour.

Yale-Cariboo Dental Society

ON April 29, 1920, the dentists of the Yale-Cariboo electoral district of B. C. convened at Vernon and organized the Yale-Cariboo Dental Society.

The object of the society is twofold:

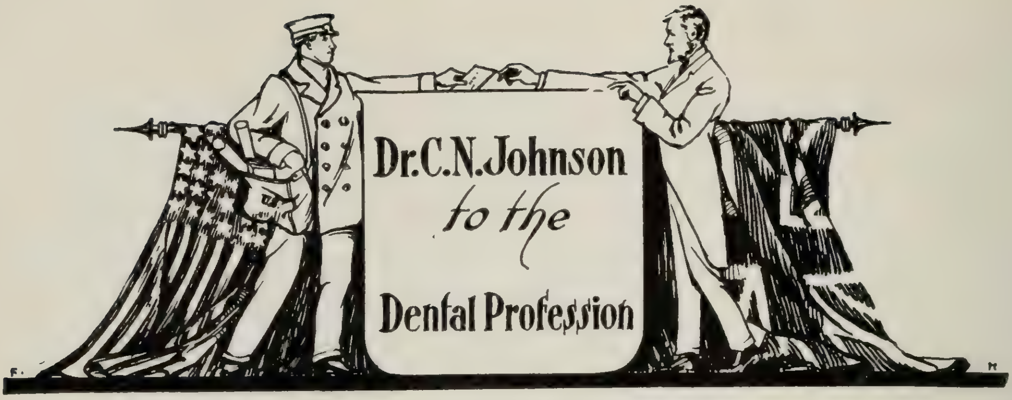
(1) To aid the members in keeping pace with dental progress by means of lectures and clinics.

(2) To promote a more intimate acquaintance among the members scattered over so large an area.

The officers elected were: President, Dr. R. Matheson, Kelowna; Vice-President, Dr. C. Corrigan, Vernon; Sec'y.-Treasurer, Dr. R. Davison, Penticton.

The first gathering since the inaugural meeting was held in Kelowna, Oct. 23, 1920, when the Temple-Pattison Co., represented by Messrs. J. Henderson and F. Parry, was host to the society. Mr. Henderson addressed the meeting on "The Business Side of Dentistry," illustrating his lecture by lantern slides. A banquet at the Lakeview Hotel terminated a pleasant and profitable meeting.

R. Davison, Sec'y.-Treas.



Dental Activities in Chicago

AT this time of year dental societies are usually in full blast, and there are numerous meetings in different parts of the city. The Odontological Society of Chicago, an old limited-membership organization, meets the first Tuesday of each month. This society has been in operation nearly forty years, and, in a quiet way, has done great good. It is limited to fifteen members, who meet each month, dine together, and hold their sessions around the table, where the best of good fellowship prevails. It is one of the most delightful of our dental organizations, and membership in it is cherished beyond that of any other with which I am acquainted.

Then there is the Chicago Dental Society, one of the largest local dental societies in the world, with a membership of nearly seventeen hundred; and its six component societies—two on the south side, two on the west side, and two on the north side. Verily it is a city of many societies. The attendance at the monthly meetings of the Chicago Dental Society often runs to nearly five hundred, and the interest is usually very keen.

For the October meeting we had as essayists Drs. Thomas P. Hinman and H. B. Johnston, of Atlanta, Ga. Their subjects were: "The Interpretation of X-ray pictures of apical granulations, giving a differential diagnosis of cases favorable and cases unfavorable for treatment and root-filling," by Dr. Hinman; and "Possibilities of the Callahan Method—a definite Treatment of Peri-apical Infection," by Dr. Johnston. Numerous lantern slides were shown to demonstrate the theories and practices of the essayists. The discussion was opened by two very able men, Dr. J. P. Buckley, latterly of Los Angeles, but formerly, and really, of Chicago; and Dr. F. B. Noyes.

The consensus of opinion, as expressed by these four able men, was to the effect that pulpless teeth may be saved, and that the extremes to which the profession has gone in the way of extracting teeth was unjustifiable. Some wonderful specimens of pulp canal filling were shown by Dr. Johnston, which had been treated by the Callahan method, and also by Dr. Buckley, treated by the usual chloro-percha and gutta-percha method. In several of the latter cases results were shown some years after, which were very gratifying and encouraging. The evening represented a splendid demonstration of the possibilities of filling pulp canals by different methods, and it will prove a stimulus to some of those who were becoming skeptical on acount of the constant attack on pulpless teeth. No one could watch the slides without being impressed with the results obtained.

A new venture launched this fall by the Chicago Dental Society is turning out a success. This is the publication of a weekly *Bulletin*, through the medium of which the members are kept informed on the activities of the society and its component organizations. The new publication is proving of great interest to the members, and it is destined to be a very pronounced factor in welding the membership together, and in extending the usefulness of the society even beyond its own ranks.

Each component society, while accountable to the parent body, has its officers and regular organization, with programmes mapped out and carried on the same as an independent society. These branch societies form a splendid training ground for the younger men, where they become accustomed to public speaking, as well as obtaining experience in conducting such organizations. The whole plan is working out very satisfactorily, and we commend it to the consideration of the large centres. In this connection a cordial invitation is always extended to visitors from every section to attend any of the meetings in Chicago. Come one, come all.

C. N. Johnson

Northern Ontario Dental Association

AT a gathering of dentists at the Sudbury Club, Sudbury, in connection with the clinics held by Drs. Bartleman and Beattie, of the Cleveland Dental Mfg. Co.'s educational staff, at which dentists were present from Sudbury, Parry Sound, Sault Ste. Marie, Copper Cliff, Espanola, Sturgeon Falls and Mattawa, an organization was formed, to be known as the Northern Ontario Dental Association. The officers elected were: President, Dr. E. A. Hill, Sudbury; vice-president, Dr. H. F. Goodfellow, Sault Ste. Marie; secretary-treasurer, Dr. G. S. Martin; members of executive, Dr. B. F. Nott (North Bay), Dr. Shannon (Sault Ste. Marie).

A meeting for clinics, etc., will be held at Sudbury in February next, the date to be decided by the executive.—*Geo. S. Martin, Secretary-Treasurer.*

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EDITORIAL

The Dentist and Malpractice Suits

LEGAL proceedings against dentists, both in Canada and the United States, for alleged malpractice, have grown so numerous in recent years as to assume somewhat serious proportions. The results in some of these have been so disastrous to both the dentist concerned and the whole profession as to demand the serious attention of every practitioner.

No doubt many such charges of malpractice against dentists are well founded, and should be frankly met by the accused and a proper settlement agreed to. But, on the other hand, many suits are instituted by mistaken or unscrupulous individuals, knowing well that most dentists shrink from such occurrences being made public, and will, therefore, settle rather than go to court.

Some members of the profession in the past have tried protecting themselves by the ordinary method of insurance, carrying a protecting policy of five, ten or twenty thousand dollars, as the case may be. However, from the standpoint of the best interests and safety of the profession this method of protection is open to serious objection. Moreover, in case of suit being brought, the insurance company generally takes charge of the defence and conducts such, not with the purpose of protecting the professional reputation of the practitioner, or upholding the dignity of the profession, but with an eye to the financial security of the company.

However, the individual dentist should not be left to wage a lone warfare in such trying circumstances. Lack of wisdom and courage in such cases has sometimes led to such foolish settlements or adverse verdicts as might prove dangerous to the whole profession. It would appear, therefore, that the defence of every dentist accused of malpractice should be made a matter of practical interest to the whole body of practitioners. This is what the Ontario Dental Society is endeavoring to accomplish. Some few years ago it formed a standing committee known as an "Advisory Committee on Alleged Malpractice Cases." The duty of this committee is to assist in an advisory way any member of the profession who finds himself accused of malpractice.

This committee undertakes to consider in a confidential manner any such case brought to its attention, and, if it deems wise, refers the practitioner to a special legal counsel who has given particular study to dental malpractice suits.

Considering the ever-increasing number of cases being brought to this committee for advice, and the large majority of which have been settled in a satisfactory manner, it would seem that the action of the Ontario Dental Society in appointing such a committee has been well advised. This committee has endeavored to keep before it not only the monetary interest of the dentist involved, but particularly his professional reputation, consistent with the safety and dignity of the whole profession.

ORAL HEALTH is fully convinced that the method of giving assistance in the individual cases of alleged malpractice is a wise one, and will materially assist in safeguarding the members of the profession against ill-advised and unscrupulous charges.

Revenue Tax Upon Prosthetic Dental Appliances

IN the July issue we discussed editorially the question raised by certain Inland Revenue officers endeavoring to collect a two per cent. tax from dental practitioners, covering dental prosthetic restorations.

The position taken at that time was that whatever might be said regarding such a tax upon prosthetic appliances made at a dental laboratory upon instructions of a dentist, the tax is entirely unjustifiable when placed upon the services rendered by a practitioner within his own office.

The Executive Committee of The Canadian Dental Association has the matter in hand. A conference is being arranged with the

Ottawa authorities, when protests will be fyled from each province of the Dominion against the classification of dental practitioners as manufacturers when rendering prosthetic service.

We believe that the difficulty has arisen, in part at least, owing to the method adopted years ago by some dentists in stating their fees in terms of "per denture," "per filling," "per crown," etc. This is not done to-day by thoughtful men. It is recognized that the practice of dentistry is not a matter of selling articles or appliances to patients, but is entirely a question of rendering service. We hope that this whole discussion will have the effect of clarifying the minds of dental practitioners regarding the importance of naming a fee, not according to the appliances or materials used, but according to the service rendered. This is the only fair and honest basis upon which the amount of a dental fee may be arrived at.

Can one entirely blame a local Excise officer for classifying a dentist as a manufacturer, if such dentist had previously sold the said officer prosthetic appliances *so much per*, without mention of the fee being for services rendered? The sooner the dental profession recognizes the importance of an honest, adequate fee, based intelligently and fairly upon the service rendered, the sooner will the profession place itself upon a proper basis in regard to the fee question.

S.C.R. Admits Error and Takes Prompt Action

IN a recent issue of ORAL HEALTH attention was drawn to amendments to the Regulations of the Department of Soldiers' Civil Re-establishment, virtually placing the dental service of that department under the control of the Director of Medical Services. As we go to press announcement has bene made that the S.C.R. has made further amendments to the dental procedure of the department. These new regulations are in effect a "right-about-face" order, and the whole dental work is now under the control of the Director of Dental Services, who reports direct to the Minister or his Deputy.

It is to be hoped that, in the interests of efficiency, the S.C.R. is now through with foolish experiments and will leave the dental service in charge of dentists, and organized and administered as a separate unit. It is only under such circumstances that the co-operation of the dental profession may be counted upon. This applies with equal force to the militia forces of Canada.

The Old, Old Wish

THE Editor and Contributing Editors of ORAL HEALTH extend to our readers sincere good wishes for a Happy Christmas and a Successful New Year.

Nineteen-twenty-one should mark the turning-point in the after-the-war periods of inflation and deflation which all countries are being called upon to face. Before nineteen-twenty-two is reached the barometers of the world will surely have reached their low point and will have started once more in an upward direction.

In the meantime let us live with frugality and thank God for the wonderful blessing of having important work to do in rendering essential health service to the human family.

MAJOR W. E. CUMMER, C. A. D. C.

Professor, Prosthetic Dentistry and Applied Physics, Royal College of Dental Surgeons.

MAJOR Cummer has been working for some time upon a text-book covering the latest developments in Partial Denture and Removable Bridgework. The Profession will be glad to learn that Major Cummer's book is now well under way, and will be published some time during the coming year.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 10 TORONTO, DECEMBER, 1920 No. 12

Possible Combinations of Teeth Present and Missing in Partial Restorations

A Little Excursion in Partial Denture Mathematics.

W. E. Cummer, Major C.A.D.C.

Illustrations by H. H. Cummer.

As indicated by the diagram overleaf, a large number of combinations of teeth present and missing are possible in either upper or lower jaw, and which has a particular interest on the subject of partial denture design, inasmuch as it forms a basis in estimation of the number of designs possible, the indexing and charting of these and restorations therefor, and the development of simple and unassailable standard principles of design.

As noted overleaf, the number of combinations appear as the result of the powers of the number two. The reason for this is that the variations appear under which these combinations are made are two in number, viz., (*a*) teeth present, and (*b*) teeth absent; the number of teeth correspond to the power, or the number of times the number is multiplied by itself, as in two teeth, 2^2 power; three teeth, 2^3, etc.

While 2 multiplied by itself sixteen times (2x2x2x2x2x2x2x2x2 x2x2x2x2x2x2x2) gives the substantial result of 65,536, so far as partial denture design is concerned, two combinations must be subtracted from this, both of the combinations of sixteen teeth fall outside of partial restoration design—to wit, all teeth present—in which case no restorations are required, and which embraces the operative problems, Fig. 3 and 4:—No. 1; and all teeth missing, which falls

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The writer wishes to acknowledge valuable assistance in the preparation of the above from Professors M. A. Mackenzie and George R. Anderson, of the University of Toronto.

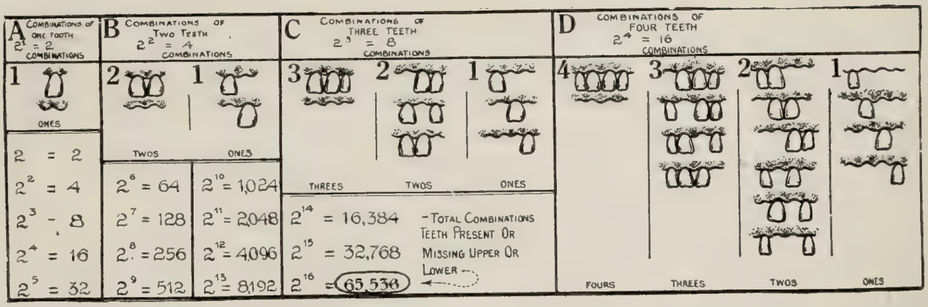
A Combinations of one tooth $2^1 = 2$ combinations
B Combinations of two teeth $2^2 = 4$ combinations
C Combinations of three teeth $2^3 = 8$ combinations
D Combinations of four teeth $2^4 = 16$ combinations
1
Ones
2
1
Twos
Ones
3
2
1
Threes
Twos
Ones
4
3
2
1
Fours
Threes
Twos
Ones
$2 = 2$
$2^2 = 4$
$2^3 - 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 64$
$2^7 = 128$
$2^8 = 256$
$2^9 = 512$
$2^{10} = 1,024$
$2^{11} = 2,048$
$2^{12} = 4,096$
$2^{13} = 8,192$
$2^{14} = 16,384$
$2^{15} = 32,768$
$2^{16} = 65,536$
- Total Combinations Teeth Present Or Missing Upper Or Lower

Fig. 1.—**Possible combinations of teeth present or missing—(two factors).**

(a) Supposing the dental armament of the jaw of man was one central tooth instead of 16 in all, the combinations possible would be as above and as follows:—

One central present,
One central missing,
Two combinations in all,
or two to the first power (2^1).

(b) Supposing the dental armament of man to be two central incisors, instead of 16 teeth, the total combinations would be as above and as follows:—

Two central incisors in Twos.
Right central incisor in only } Ones.
Left central incisor in only }
Two central incisors out None.
Four combinations in all, or two to the
second power (2^2), or $2 \times 2 = 4$.

(c) Supposing the dental armament of man to be three teeth instead of 16, two centrals and a left lateral, the possible combinations of teeth present and absent would be as above and as follows:—

Three teeth present Threes.
Left central and lateral. }
Right central and lateral. } Twos.
Right and left central. }
Right central. }
Left central. } Ones.
Left lateral. }
Three teeth absent None.
Eight combinations in all, or two to the
third power (2^3) or $2 \times 2 \times 2 = 8$.

(d) Supposing the dental armament of man was four teeth, as above in Section D, the following combinations are possible, as shown above, and as follows:

One combination of four teeth.
Four combinations of three teeth.
Six combinations of two teeth.
Four combinations of one tooth.
One combination of no teeth.
Sixteen combinations in all, or two to the fourth power,
(2^4 or $2 \times 2 \times 2 \times 2 = 16$ combinations.

Proposition: If 2^4 combinations are possible with a total armament of four teeth, then with a total armament of 16 teeth, as found in either jaw of man, 2^{16} combinations are possible, a grand total as shown of 65,536 combinations.

in the domain of full denture prosthesis, Fig. 3 and 4:—No. 256.

It must also be remembered that the number of 65,534 represents only one jaw, of which, in this instance, the upper has been chosen. The design for the lower differs from the upper, because of the distinct anatomical difference between upper and lower teeth and their ability to carry stress or retain appliances; also the element of the narrower ridge and of the presence of the tongue, hence the above number might be logically doubled, with a result of 131,068 combinations of teeth missing or absent, which doubling is offset by the fact that a design occurring on the right side and an identical

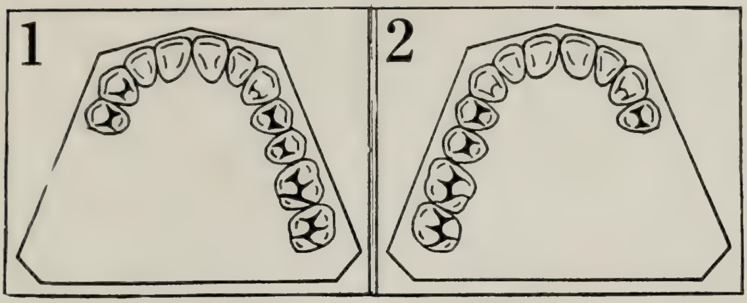

Fig. 2.—**Designs for possible combinations of teeth are divided by half by similar conditions occurring bilaterally.** In above chart, for purpose of practical design, A is identical with B, although mathematically a different combination. All combinations in scheme here outlined have a bilateral counterpart, as above. Hence the total number of 65,534, doubled by combinations of upper and lower, is halved and brought back to 65,534 by the above.

design occurring on the left are for all practical purposes the same, Fig. 2, leaving the actual designs possible at 65,534.* While the figure takes into account only two factors, (*a*) teeth present and (*b*) teeth absent, taking no account of abnormalities of position or form, which more or less inconsiderably affect the essential features of design, but which may be provided for by comparatively simple variations in design, and, if included, would push the possible number of combinations up to a prodigious figure, of undoubtedly only theoretical value.

Notwithstanding the large number of combinations of natural teeth missing and present with complication of vital, non-vital, in buccal, lingual, mesial, distal, superior or in inferior occlusion, for which we as members of the dental profession are called upon to make suitable restoration designs, the writer would submit that, in his opinion, for working purposes all of these cases may be made to fall into four simple classes, which have as their basis the choice of number and position of the direct retainer, as indicated, Fig. 6.

Upon these chosen teeth may be used any of the direct retainers in common use, as the various clasps, interlocking attachments, etc. (See ORAL HEALTH, March, 1920, issue.)

The balance of the design merely consists in supplying the saddles, joining these with elliptical wire, 14 gauge wire, cast pieces or similar, following a comparatively simple mental operation in their choice and arrangement; finally, the addition of direct retainers, indirect retainers, and occlusal rests, if indicated.

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* This number is estimated to be considerably reduced in practice because of the presence or absence of the third molar in restoration remote from it do not materially affect the design. For example, a restoration for a single lateral tooth with or without one or both third molars would be identical.

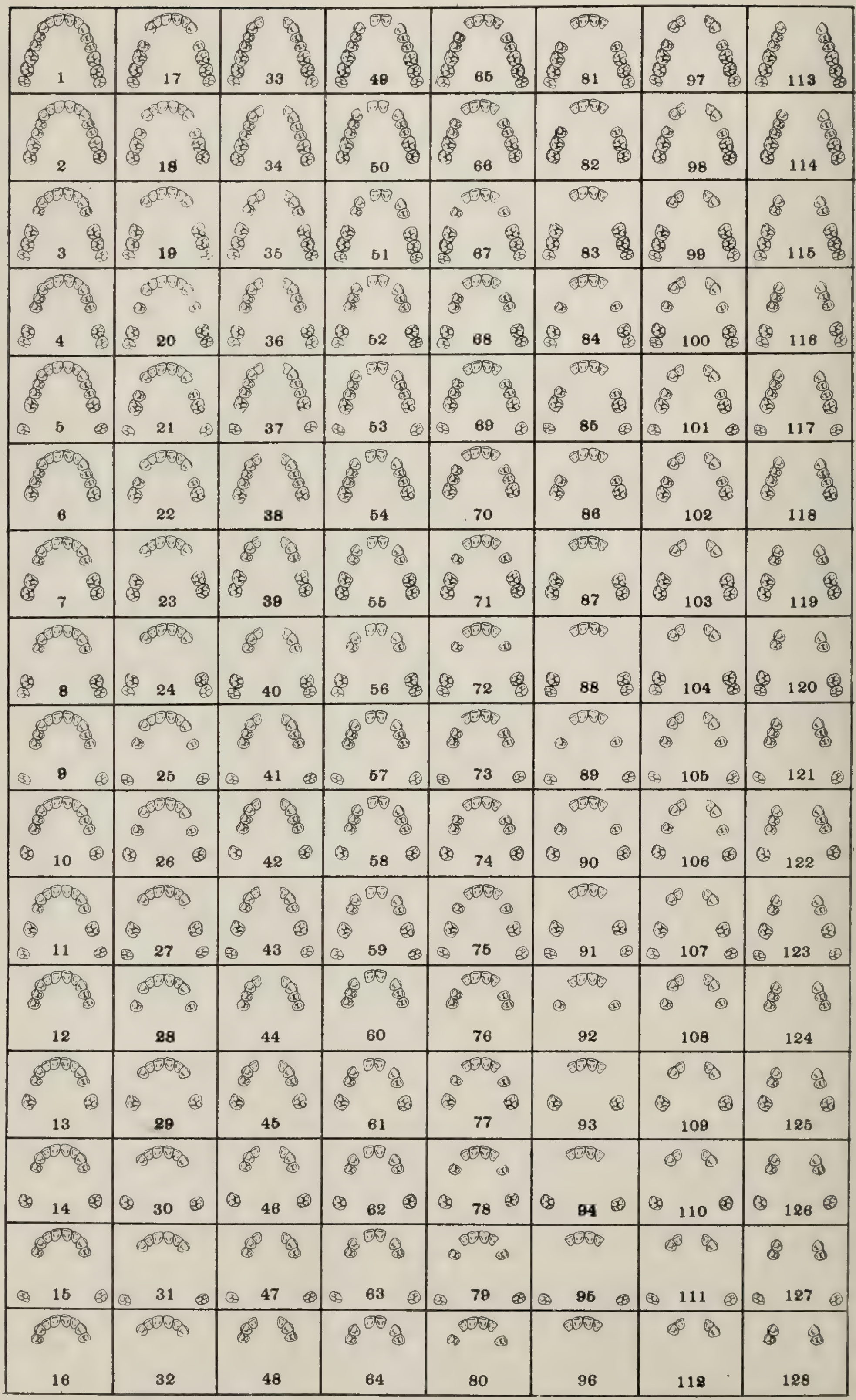


Fig. 3.—**All of the possible symmetrical (or same on each side) combinations of the upper teeth** (present or missing only factors, not including malposition or other factors). The above was developed from the eight teeth between the left central incisor to the left third molar, inclusive, in a similar manner as in Fig. 1, Section D (which shows the sixteen combinations of four

(See next page)

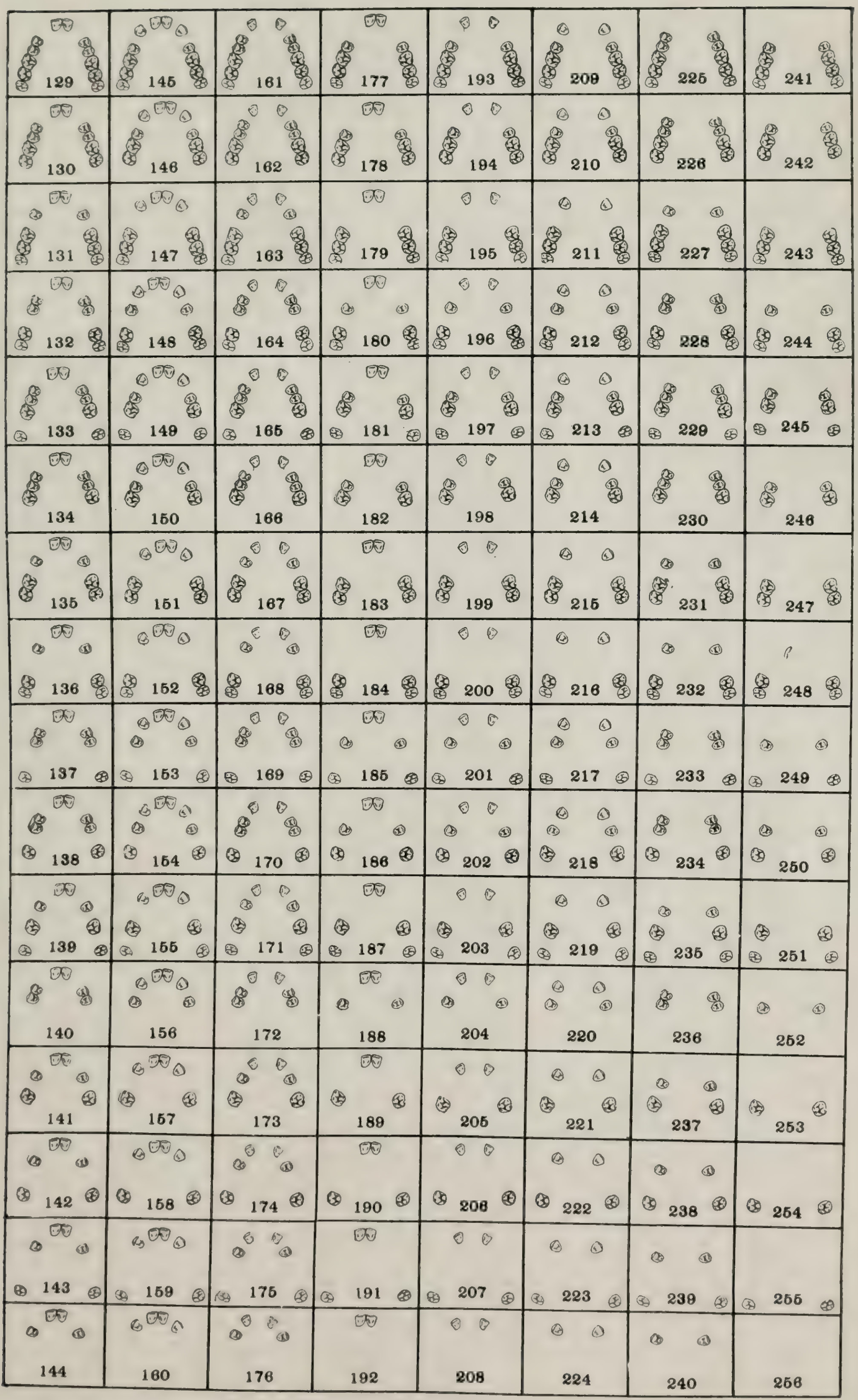


Fig. 3 (continued from previous page)

teeth. The result of this development showed 2 combinations, or 256. By adding to each its counterpart on the right side, the above chart was developed. The above chart of 256 combinations represents only 1-256 of the total number of upper combinations.

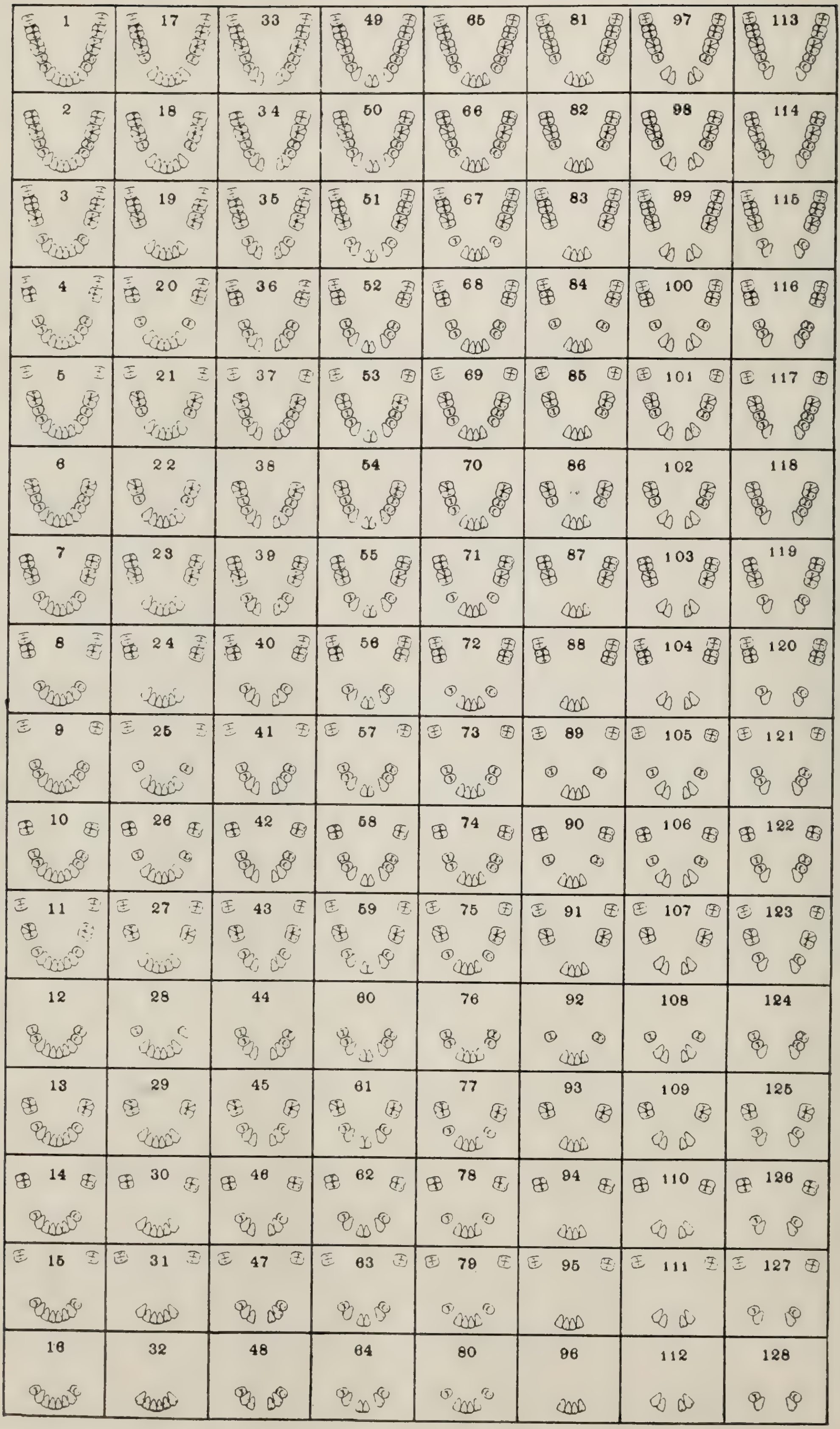


Fig. 4.—All of the possible symmetrical combinations of the lower teeth (factors present or missing). This chart has been developed in precisely the same manner as the upper chart in Fig. 3. The above chart of 256 combina-

(See next page)

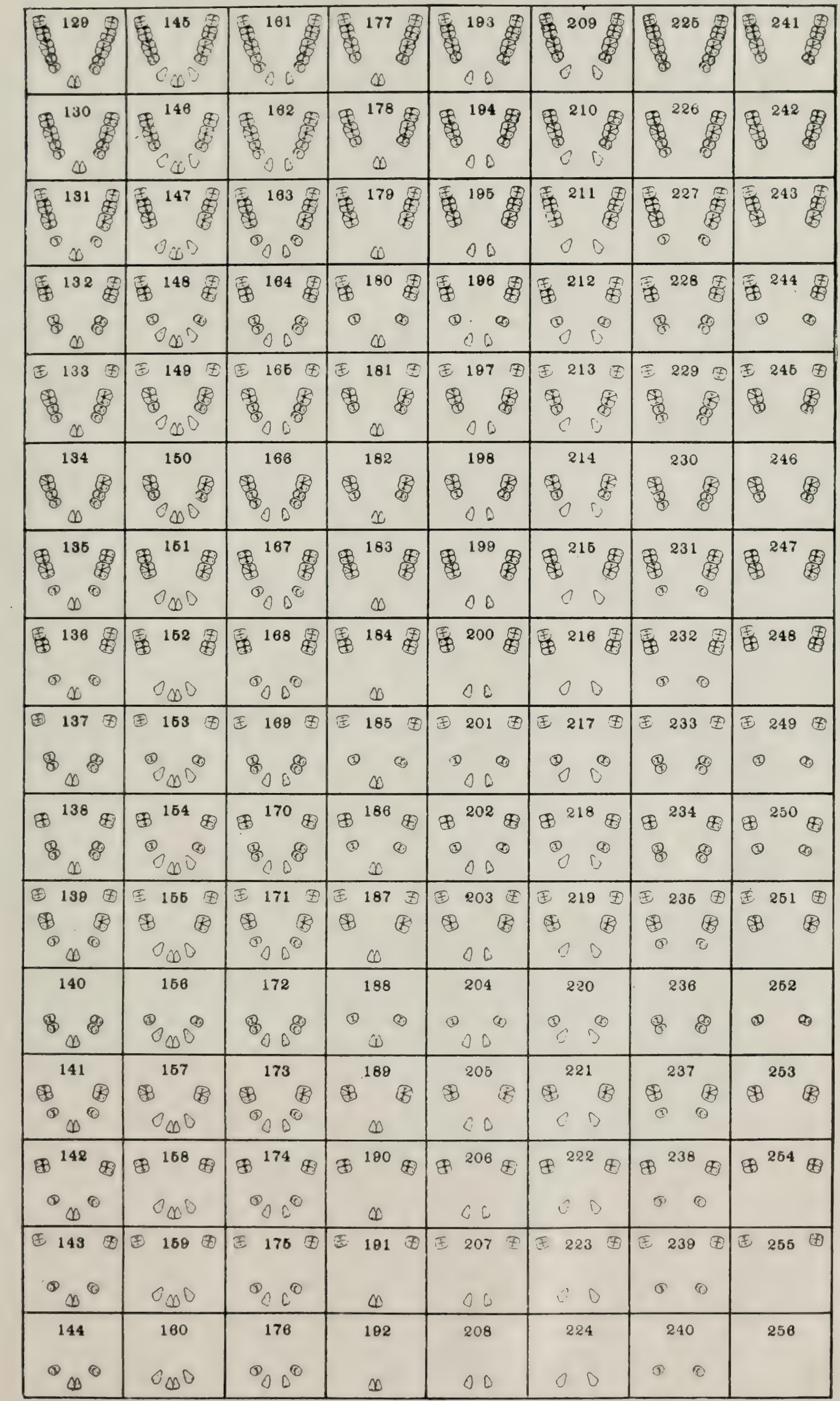
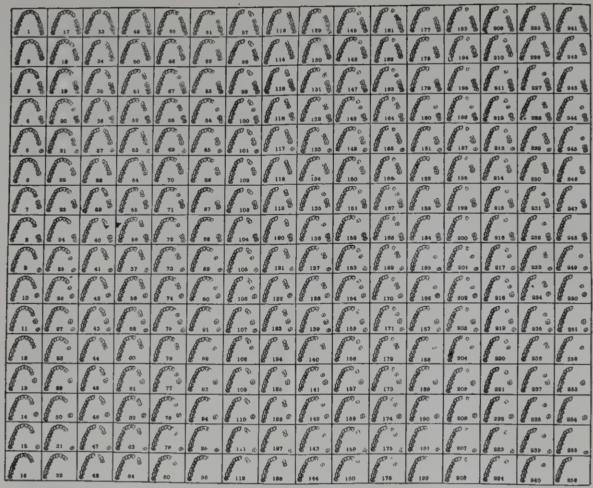
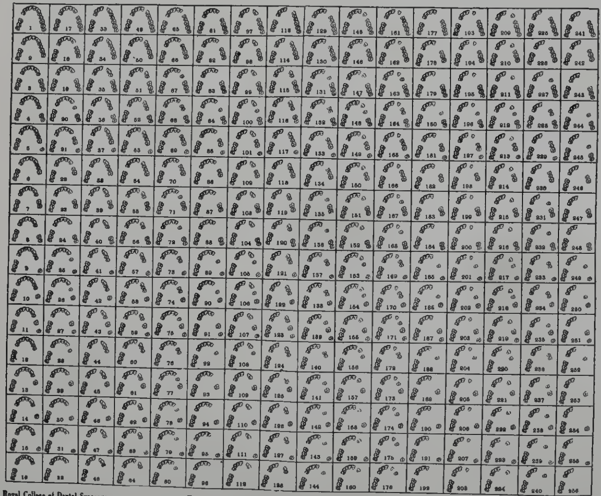


Fig. 4 (continued from previous page)
tions represents only 1-256 of the entire number of lower combinations possible.



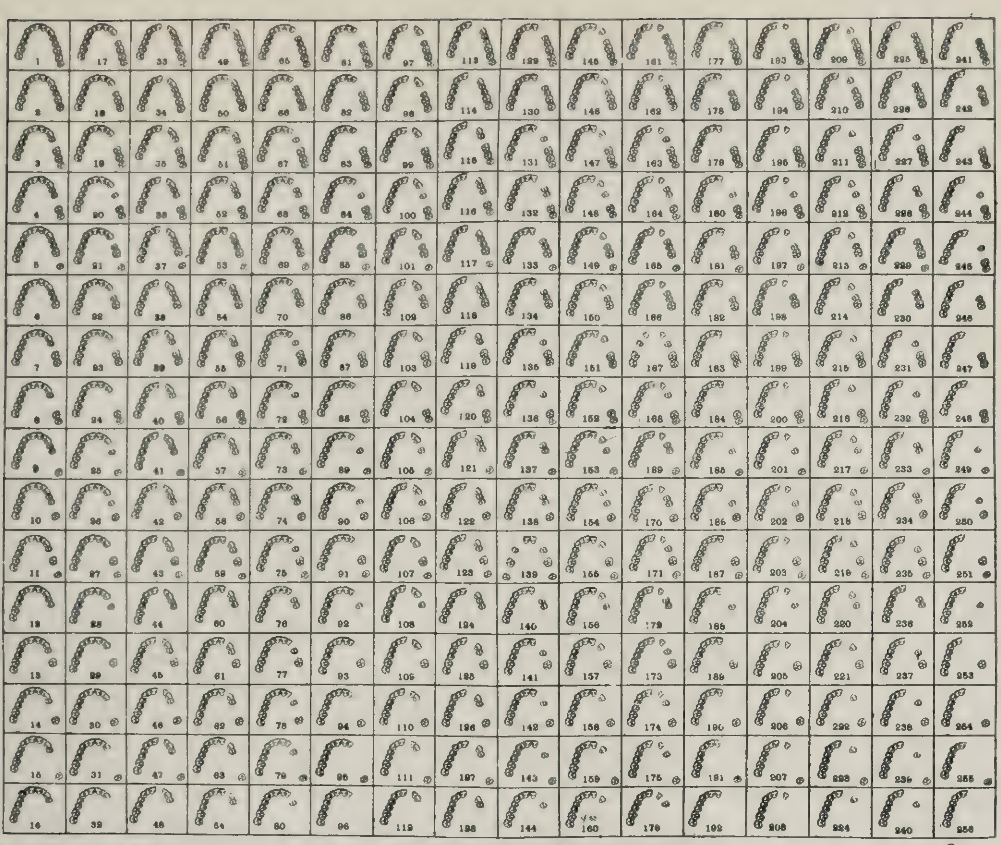
Royal College of Dental Surgeons, Toronto COMBINATIONS OF NATURAL TEETH (Two Factors) Folio 1

Fig. 5A



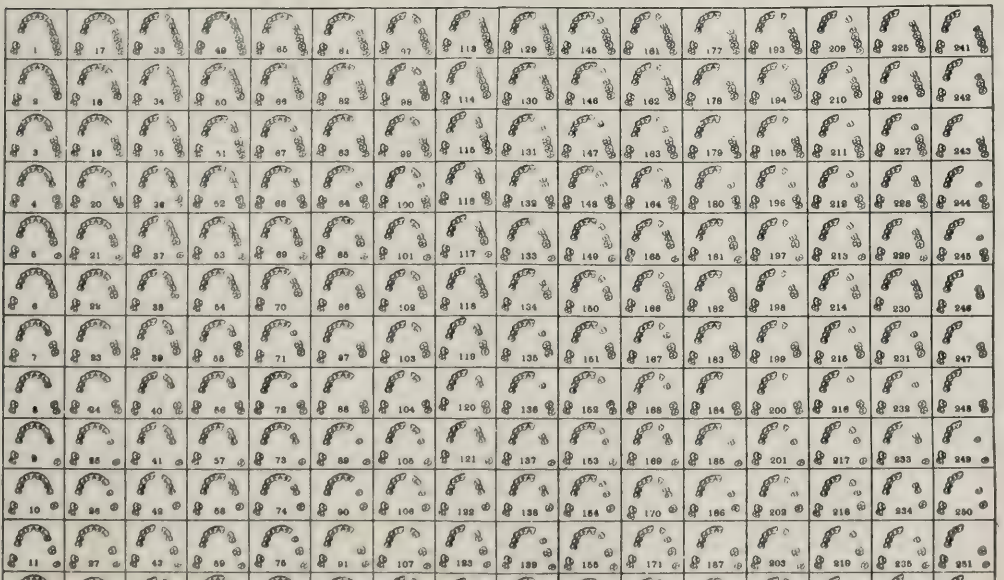
Royal College of Dental Surgeons, Toronto COMBINATIONS OF NATURAL TEETH (Two Factors) Folio 3

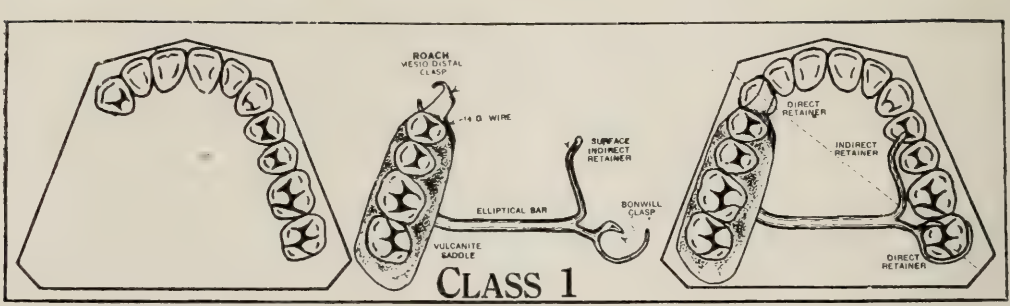
Fig. 5.—**Developing 65,536 combinations of teeth present and absent in the upper mouth.** The above shows 1,024 combinations of teeth present and missing in the upper mouth, or four folios of 256 each, which is 4-256 or 1-64 of the entire number possible. If the above is examined with a hand magnifier, the plan of development from the symmetrical chart is readily apparent. In Fig. 5-A (Folio 1) the right half of Section 1 of Fig. 3 is successively applied to the 256 varying left halves of the same chart, giving the right side identical in each case, with the left side varying as in the symmetrical chart in Fig. 3, in 256 varieties. Similarly in Fig. 5-B (Folio 2) the right half of Section 2 of Fig. (See next page)



Royal College of Dental Surgeons, Toronto COMBINATIONS OF NATURAL TEETH (Two Factors) Folio 2

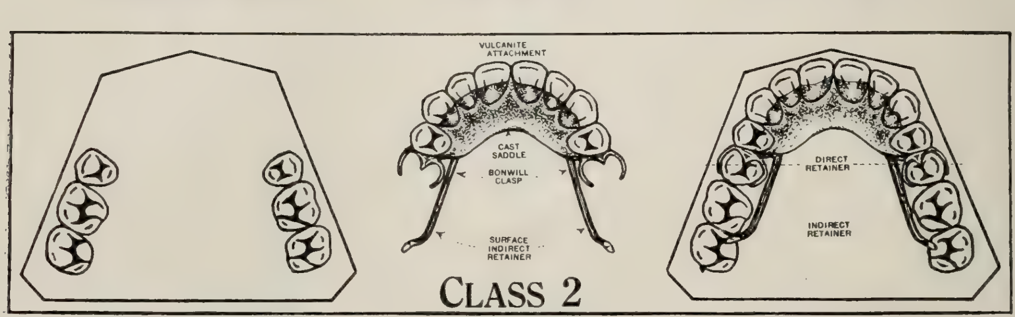
Fig. 5B





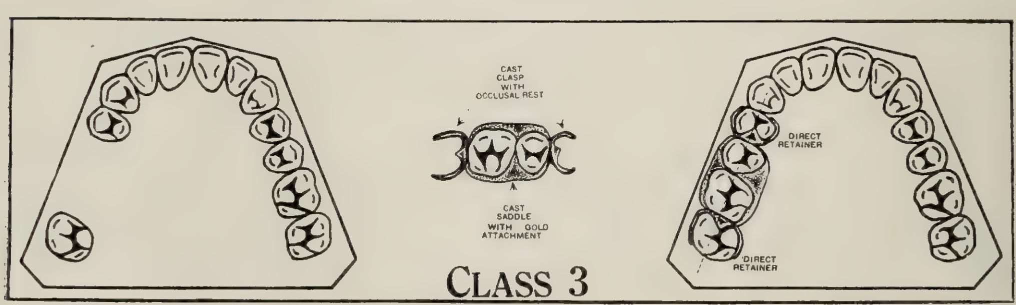
CLASS 1

CAST WITHOUT DENTURE. UPPER DENTURE. CAST WITH DENTURE



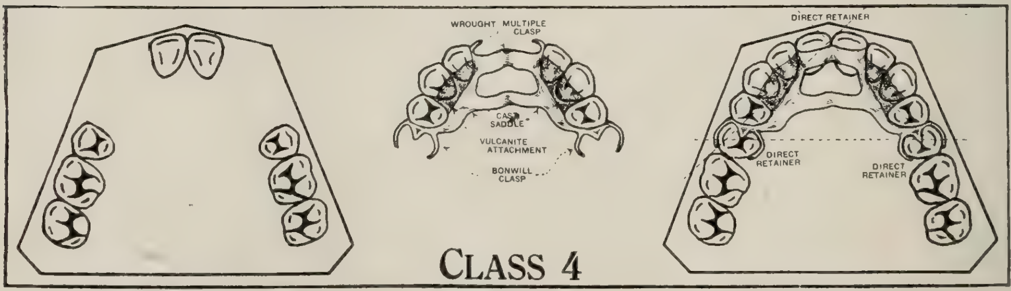
CLASS 2

CAST WITHOUT DENTURE. UPPER DENTURE. CAST WITH DENTURE


CAST CLASP WITH OCCLUSAL REST
CAST SADDLE WITH GOLD ATTACHMENT
DIRECT RETAINER
DIRECT RETAINER

CLASS 3

CAST WITHOUT DENTURE. UPPER DENTURE. CAST WITH DENTURE



CLASS 4

CAST WITHOUT DENTURE. UPPER DENTURE. CAST WITH DENTURE

Fig. 6.—**The four classes of partial denture restorations depending upon the choice of direct retaining natural teeth.**

Class 1—All cases in which **two teeth only,** which are **diagonally** opposite, are chosen as anchor teeth for the attachment of direct retainers, with indirect retainer or retainers as auxiliary.

Class 2—All cases in which **two teeth only,** which are **diametrically** opposite, are chosen as anchor teeth for the attachment of direct retainers, with indirect retainer or retainers as auxiliary.

Class 3—All cases in which **one or more teeth,** all of which are on the **same side,** are chosen as anchor teeth for the attachment of the direct retainers, with, or usually without, indirect retainer. This class includes the majority of fixed and removable bridge designs.

Class 4—Cases in which **three or more teeth** are chosen as anchor teeth for the attachment of the direct retainers, disposed in triangular or quadrilateral or similar relationship, without indirect retainer.

A Letter From "Habec"

(We are glad to publish the accompanying letter from our Contributing Editor, Dr. J. Wright Beach, of Buffalo, under his nom de plume "Habec." "Habec" has always been a good friend of Canadian Dentists, and we have greatly missed his monthly letters during the past year. Our American readers enjoy "Habec's" contributions just as much as Canadians, and we sincerely hope that among Dr. Beach's New Year resolutions will be, "Resolved that I will not again neglect my good friends, the readers of Oral Health."—Editor.)

SEVERAL years have elapsed since the mental vagaries of Habec have been heralded broadcast throughout the fair Dominion of Canada, therefore it is with a marked degree of satisfaction that he is privileged again to enjoy communion, through the kindness of ORAL HEALTH, with his many friends and fraters. Meanwhile the great war has come and gone, leaving the indelible imprints of its influence upon humanity in general and upon dentistry in particular. Many lessons have been learned therefrom, many are yet to be learned and many never will be learned, and great as have been the benefits thus far secured, there remains a far greater proportion yet to come.

A retrospective glance may not be amiss at this time; Habec distinctly recalls the momentous period through which the civilian practitioners of Canada passed while leading up to the development of a most efficient dental service which in due time became the only separate military dental establishment in the world. We plainly recall that portentous meeting of the Toronto Dental Society in November, 1915, when the first resolution was passed with the authorities at Ottawa as the objective.

The influences thus brought to bear through the determined and persistent action of the Canadian dentists resulted in establishing a status for dentistry as related to the military, never before secured. There are a few names which will ever occupy a prominent place in the history of dentistry and the great war, well merited and fully deserved. You know them all, and Habec is happy to number them amongst his most esteemed friends.

We hope to see the history of dentistry in the Canadian Army properly compiled in book form. It would trace from cover to cover a line of unbroken achievement, self-sacrifice and sterling patriotism. It may not be known to many of the profession that the first incentive to emulate the example of our Canadian brothers, emanated from the historic meeting of the Toronto Dental Society above referred to.

Early in 1916 the Preparedness League of American Dentists organized for the purpose of making dentally fit our National Guard for service on the Mexican border and also to assist our government in case of war.

Prior to our entrance into the World War the members of the League throughout the country rendered an invaluable service to our troops who protected our borders from invasion.

When war was declared on April 6th, 1917, the League had been in operation for fourteen months and was reasonably well organized throughout the United States, having about four thousand members. On Sunday, April 15th, there met in Washington at the call of Doctor Franklin Martin, six dentists who were organized into the Committee on Dentistry of the General Medical Board, Council of National Defense. Dr. E. C. Kirk, dental member of the General Medical Board, was appointed Chairman of the Committee. Dr. Morehead, Chicago; Dr. Brown, Milwaukee; Dr. Price, Cleveland; Dr. Wheeler, New York; Dr. Beach, Buffalo, being respectively Chairmen of the various sub-committees originally appointed. Habec therefore became the official representative on this Committee for the Preparedness League of American Dentists.

The combined efforts of the members of the original committee, together with those subsequently appointed, represented civilian dentistry in its connection with war activities. The specific problem of the sub-committee on Preparedness League of American Dentists was to assist in making the draftee dentally fit for Army and Navy service and to recommend suitable candidates for the Dental Reserve Corps.

The organization immediately realized the importance and vastness of the service required and forthwith began an expansion program which eventuated in one of the most perfectly formed dental organizations in existence. Headquarters were established in New York City and direct connection with the War Department was secured through the appointment of Major W. A. Heckard to active duty at headquarters, and it was largely through his untiring service and self-sacrifice that such wonderful results were obtained.

The League is still in existence and we believe that further service may be rendered to the profession through such activities as future conditions may develop.

The League always received the heartiest co-operation of its Canadian allies and particularly the good offices of Lt.-Colonel Walter G. Thompson and Lt.-Colonel Clayton. We might add that the League has as its only Canadian member our good Editor, Wallace Seccombe, therefore you may well understand our feeling of gratitude to the profession of Canada for the part it has played in the affairs of the League.

Habec has enjoyed the short articles on pertinent topics from the pen (perhaps I should say, typewriter), of our mutually beloved frater, Dr. Johnson. A recent article in which he treats of the baneful influence of fear in relation to our daily work, is most timely and thoroughly appreciated from our viewpoint. Habec has frequently made the statement that the dentist finds his most skillful services called for in the treatment of the patient above the eyebrows rather than below; in other words, dissipation of fear is essential before good service may be rendered.

We well recall a statement by Dr. Johnson relative to painless dentistry in which his life-long experience has proven that pain can best be limited by the aid of small, sharp instruments, especially the bur, skillfully manipulated and which must also be accompanied by confidence in the operator. When this situation obtains, to which is added a spirit of co-operation and helpfulness by the patient, the best dentistry is accomplished. Never in the history of the profession was the safe and sane dentist more needed than at this time, while the spirit of devastation is rampant throughout the land. Nothing could be more apparent or indisputable than the fact that, through lack of comprehension of dental conditions from the standpoint of the dentist, our medical confreres are rapidly forcing us into an unparalleled period of destructive dentistry and we regret to say that many of our own profession do not seem adverse to the situation. Those of us who have passed through one after another of these periods of revolution, as it were, and watched the short and violent course of each successive innovation, can more fully understand what it all means and very closely predict the final outcome. It is scarcely exaggeration to say progressive dentistry as an actual science has received a severe, though temporary, check. In fact our vaunted skill in the treatment of diseased teeth is threatened to be classed as a Lost Art. We do, however, appreciate that, like the great events in history, from chaos a new structure rises far more useful and potent than the original. This fact we may cling to as our Great White Hope. We can however begin to see the light breaking through the clouds and the prospect for general improvement in our methods is apparent, and we will be able to approach the present problem with a clear understanding of cause and effect. We are gradually developing a large number of young men who will creditably follow the lead of those who are now filling the high places in our great profession.

PROTECTION OF EYES WHILST SOLDERING.—Relief from the glare of the flame will be obtained by the use of plain smoked glasses, which should be quite dark.

The Relation of the General Practitioner to the Specialist in Dentistry

A. W. THORNTON, D.D.S ,
Dean Dental Faculty, McGill University.

Resume of address delivered before the Ottawa Dental Society, October 26th, 1920, *prepared by Major W. R. Greene.*

AT perhaps no time in the world's history have there been so many and so important changes as are taking place at the present time. At no time has it been so necessary for men almost daily to readjust their ideas and to bring them into harmony with those changing and changed conditions. The world has grown very much smaller than it was even twenty-five or thirty years ago. What with wireless telegraphy, Atlantic cables, wireless telephones, and the great advances that have taken place in science and practice, knowledge has increased to such an astonishing extent that no man can hope to be even fairly conversant with all the current thought of the day. While the world has grown smaller, knowledge has increased. The research work of the past few years has resulted in the development of science that would have been looked upon a few years ago as nothing less than marvellous, and it is quite impossible for any man to possess even a tithe of the knowledge which is available at the present time. It is quite impossible for any man in any of the professions to master all the knowledge of the profession or calling in which he finds himself. Take the profession of law, for instance.

* * * *

The discovery by Harvey of the circulation of the blood caused the practice of medicine to become a very much wider thing; and then, in comparatively recent times, the work of Pasteur and Koch and Lister gave a new impetus and a broader and wider field to medicine. When they discovered the fact that disease was due to certain micro-organisms or pathogenic organisms in the blood stream, they threw a new light upon the whole question of disease; for before that, you know, it was thought that there were certain fluids in the body, and that a lack of harmony or balance in these fluids was the cause of disease or discomfort. More recently another discovery has added greatly to the wealth of knowledge in medicine—the discovery of the X-ray by Roentgen.

* * * *

Now in many instances we can diagnose by using the X-ray to discover the conditions while the disease is still working in the patient;

and that has added greatly to our knowledge.

Growing out of this increased knowledge and this decreasing size of the world, there has come into existence a motto that you find in nearly every business, especially in commercial businesses, and that motto is premised or contained in the two words, " Maximum efficiency." Now, what do these two words mean? Simply this: the greatest possible output for the least possible expenditure of time and energy. So we have our commercial experts in every large industry, trying to bring about that condition of maximum efficiency.

* * * *

Now, what is the result of these changes that have come to the world? I think the result is seen in the fact that while there is an increase in output, that condition has practically brought about the death of initiative. In the days when a man made a pair of shoes, doing all the work himself, he put his own ideas into the work. When a man made a carriage, he put his own ideas into the building of that carriage. But now no one man does more than a small part of the work; he is simply a part of the machine, and the research work, the individual work, is left to the master minds. Years ago that same thought was expressed by Goldsmith when he went through Europe on foot, looking at the conditions of the various peoples in that part of the world, and when he put into his poem, " The Traveller," these words:

" Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay."

To some extent, as the result of this attempt to bring about increased efficiency and output, men are decaying. But, happily, Goldsmith wrote another line in that poem:

" Those who think must govern those who toil."

It is true to-day, notwithstanding the labour unrest, that brains are greater than hands; that every action must exist first as a mental conception. So we ought to bear this in mind, all of us.

Referring again to medicine, you will remember the conception we all had of the old doctor who attended to us and our families. We would say that he knew our constitutions; he combined in himself the various specialties of the present day; he was the only specialist that was known. He was essentially a man who administered medicine, following the old line of the desire to restore that balance in the fluids of the body; and he administered medicine internally, hoping that this would be brought about. He was the physician, the surgeon, the obstetrician, the gynaecologist, the oculist, the aurist, the neurologist, the psychiatrist, and the alienist. Now we have added a few more; there is the chiropractor, the osteopathist, the

Christian Scientist—and the whole field has been divided and subdivided until it is almost impossible to differentiate between the many specialists of the present day. It is true that with the increase of knowledge this division became necessary, but division and subdivision have run riot during the present age. There are certain reasons for that condition. First, there is an unwillingness on the part of man to pay the price for knowledge. To get a wide knowledge means that a man must burn the midnight oil; so men are moving in the line of least resistance. They say: " Instead of trying to cover a wide field and become generally proficient, I will narrow the field of my endeavour and hope to cover it." In that way specialists have grown up. Then there is the advanced standard of living. Men and women to-day are willing to pay the price for the best goods and the best class of service; men realize that if they call themselves specialists and live up to their calling they can obtain increased fees for their services, and that has had a great deal to do with the sub-division of medicine and dentistry into various classes or specialties.

As to the specialties in dentistry, possibly the first one is orthodontia. Then we have the pyorrhea specialist; the crown and bridge specialist; then the exodontist; then the prosthodontist; and recently the men who are engaged in pyorrhea work have called themselves periodontists. In fact, there are so many " dontists " that it is only with a good deal of courage, and almost an expression of regret, that some of us call ourselves " dentists."

Now, in my estimation—and I want to discuss this matter frankly with you—many of these sub-divisions are absolutely unnecessary. As I see it, there is not room for more than two specialties in dentistry, one the specialty of orthodontia, and the other the specialty of oral surgery. Now this involves no reflection on the men who feel that they have a special aptitude for some particular calling. But it does mean that outside of these two specialties the profession of dentistry is sufficiently limited to enable any man of ordinary intelligence and common industry to give satisfactory service in these various lines, with the exception of the two that I have just mentioned. Why do I except orthodontia and oral surgery? As to orthodontia, the reason is—of course, this is only my own opinion—that the practice of this specialty requires a special fondness for and ability to get along with children. Every man does not possess that fondness and that ability.

* * * *

Now, the orthodontist carries on his work largely with children, and he must be a man specially qualified to deal with them. Moreover, the practice of the specialty of orthodontia calls for, perhaps, a closer special study than any of the other mechanical branches of dentistry. It calls for a high standard of mechanical ability, a very accurate knowledge of the anatomy of the parts affected, and an absolute honesty of purpose in dealing with the patients and the parents of the patients. The work of the orthodontist is not finished, as in the case of our ordinary practice, in a day or a week, or two or three weeks at the outside; he must carry on the work for years; therefore, it requires a man of peculiar temperament and peculiar ability to practise orthodonita. Then there is another reason: up to the present, at least, I do not think that the work carried on in our schools has been sufficiently broad to enable a man to go out and practise orthodontia as successfully as he could prosthetic or operative dentistry.

In connection with this, as in connection with every other specialty, I may say that no man should go out from college and enter upon the practise of a speciality until he has had at least some years experience in general practice. Now, why? Well, for this reason: the tendency of all specialists is to become lop-sided—that is unavoidable. " As a man thinketh in his heart, so is he "; if he thinks orthodontia, then to him orthodontia is the biggest thing in life. If he thinks pyorrhea, then to him pyorrhea is the biggest thing in life. Then there is the inability of the specialist who has entered upon the practise of his specialty immediately after graduating to see the conditions from the standpoint of the general practitioner. Therefore, in order that he may have the confidence of the men who will send him their patients, it is necessary that he should have some years at least in general practice.

Now, for the case of the oral surgeon—that is, the man who will be able to operate for cleft palate, for hair lip, and for all the deformities that may occur in and about the mouth. Just there we approach the border line between dentistry and medicine, as this latter term is usually used. The question arises: is oral surgery a specialty in medicine or a specialty in dentistry. I have had a number of requests recently from all over the country inquiring whether dentists could come to Montreal and get some special work in oral surgery. Now, that is not possible for a man who is not trained in medicine and in surgery; a knowledge of both, it seems to me, is an absolute necessity. The essential thing in these operations is the condition after treatment and the possibilities of restoration. This demands the services of men fully trained in both sciences, but with their chief interest centred in dentistry. In the final analysis the permanent condition must rest with the skilled dentist. Now, in order to be an efficient specialist in that line, a man must be a general surgeon as well as a special surgeon. You could not imagine a man calling himself a general surgeon if he operated, say, only in cases of appendectomy. You could not imagine a man calling himself a specialist who would only operate for hernia or for hemorrhoids. These men are skilled surgeons, so we must have a man who is versed in the whole field of surgery, and who can make a success of his work if he goes into oral surgery, as Dr. Brophy, Dr. Gilmour, and other men are doing. I hope that in the near future we shall have in all our large cities, such as Ottawa, Montreal, Toronto, and so on, men who are trained and licensed both in medicine and in dentistry, and who will be giving their chief attention to mouth conditions, carrying along their intensive work in the line of dentistry.

Now we come to the question of the periodontist. In my opinion the work of the periodontist should never be divorced from that of the ordinary practitioner of dentistry; I believe that every man should do his own periodonto-clasia or pyorrhea work. Now, this does not imply that I think that as good results are being obtained by the men in general practice as by those who are making a specialty of this work. I know that they are not. But it does imply that the man in general practice should be able to give just as good and intelligent service as the specialist, if he is willing to pay the price. On what do I base this assertion? There are many cases where a man is a general practitioner to-day and a specialist to-morrow. It is quite impossible that all who call themselves specialists should have assimilated a vast store of wisdom or manipulative ability, sufficient to cause a wide difference between the so-called specialists and the man in general practice. On the other hand, I do know that many of these specialists who feel a fondness for and a special aptitude in certain lines of work have given months or years of particular attention to certain classes of work before finally making up their minds to adopt this work as a specialty. There is a reason for this. One reason is the necessity for study, and work, and practice, to develop a high standard of fitness. Another reason is the necessity for obtaining a livelihood while preparing for the transition from general practice to the work of a specialist.

* * * *

It is no longer possible to treat a case of pyorrhea, or interstitial gingivitis, or Riggs Disease, or trench mouth, or Vincent's angina, or ulcerated stomatitis, or any of these conditions, by whatever name known, with the instruments usually found in the office equipment of the man in general practice, or in the time generally given to such cases. In altogether too many cases, such service is still too closely linked with the old idea of " cleaning a set of teeth " and with the old fee of fifty cents or a dollar.

There is another reason why the specialist is able to command a respect and a fee out of all proportion to that enjoyed by the men in general practice. Go to the office of any of the men in the various specialties, and then go into the majority of offices of the men in general practice, and you will discover for yourself many of the reasons for this difference of respect and appreciation. Our men in general practice must lay seriously to heart the conditions of the office, their nearness to approach to aseptic conditions in all their operations.

One of the best known dentists in this province, a man known to every one of your said to me a good many years ago: " I should not have been a dentist. I have not one single, solitary mechanical idea in my mind. I do the thing that I have been taught to do until I become fairly proficient in that thing. I continue doing it the same way until someone tells me of a better way; then I try that better way. But I have never been able to offer anything original myself." Well, that man is one of the most successful dentists we have—why? Because of his suavity of manner, his courtesy, his culture of mind, and because of the way he has always kept his office in the city in which he practises. As I have intimated, he is, perhaps, one of the most successful practitioners in the province at the present time.

There is a great need at the present time for a revival in study, so that the men who have been out of college for some time may have a chance to come in contact with recent discoveries in histology, pathology, and bacteriology, and with the variations in treatment made necessary by these discoveries.

I do not know whether you had here within the last two years, or perhaps within the last year, a man who was giving instruction in nerve-blocking and in conduction anaesthesia. I do not know whether Dr. Smith has been here or not. I took his course in Toronto—not that I hoped to use it, but simply to keep in touch with the work and for the purpose of teaching students in the hospital. Then I took his course when he came to Montreal. Now, why did Dr. Smith meet with the success which attended his work everywhere he went? Simply because he was breaking virgin soil. The men whom he was teaching had practically no working knowledge of the anatomy of the head and face and neck. They had no idea of the area that would be anaesthetized by the injection, say, into the infraorbital foramen, into the mental foramen, into the anterior and posterior palatine, into the mandibular foramen; so the great part of his work was simply that of teaching the minute anatomy of these parts upon which they were working. So much have we laid that to heart that in McGill at the present time we are laying emphasis on that part of our teaching of anatomy. I think it is very important that a man should have a knowledge of the brain centres from which the nerves rise, their position in the brain, the parts of the anatomy supplied by the brain, the part that will be anaesthetized by making an injection into any one of these nerves, the depth of these foramina from the surfaces, the length of needle necessary, the part that will be anaesthetized.

* * * *

I received a circular this week from a man who proposes to give a post-graduate course in the surgical extraction of teeth. Now, I think something of that kind is due at this time. Most of us have been extracting teeth in a manner which is anything but surgical. I think that a great advance is due, and can be brought about in this line. This man is giving a post-graduate course of four days for the modest sum of $200. Now, that looks like a good big fee. We gave Dr. Smith $1,800 for a week's work in Montreal. That looks like a good deal of pay for a week's work, but he was months and months down in Alabama, where there is no anatomy law, and where he could sit at the bedside until the patient died, call for the body two minutes afterwards, and prepare his specimens. He spent months down there doing work for which he did not get anything. So that if these men do qualify to give that kind of service which will enable you to go out and do better, why, we can afford to pay them a fairly good fee for the service they give.

This need of study is being supplied in many places by the study classes organized by the dentists in many American and Canadian cities. The method of conducting these splendid classes is as follows: a number of men form a class to study some phase of the regular work. After the fullest investigation these men divide the work into various steps, each member of the class becoming responsible for only one step in the operation, and doing this step so frequently that he becomes expert in it, and learns all its advantages and disadvantages, its easy parts and its difficult parts. So classes have been formed in prosthetic restoration, in the technique of inlay work, in conductive and block anaesthesia, in the treatment of pyorrhea, in removable bridge-work, in partial denture work. Recently Dr. Nesbit, of Boston, gave a course of instruction in cast clasp work, setting forth what I believe to be so far the most suitable way of making restorations that the profession has yet learned of, getting away from the necessity of grinding down and mutilating teeth in order to put on shell crowns.

In order to keep abreast of the times it is quite necessary that many of our dentists should obtain a new perspective of their relation to their patients, to themselves, and to the profession. It is simply impossible for any man to keep abreast of the times without stated periods for study and observation. It is just as necessary, if a man is to attain to his own full stature, that he should spend a certain amount of money every year in study, in travel, in coming in contact with his fellow practitioners, in order to keep in touch with the newer developments, as it is that he should spend money for coal, or groceries, or clothing, or material, or for instruments for his office. Indeed, his ability to buy the things usually spoken of as the necessities of life will probably be in direct ratio to the time which he spends in study and improvement, because the latter expenditure will immeasurably increase his earning ability.

Specialists are here to stay. Some men are criticizing them. Some who are suffering financially are finding fault. Most thoughtful men in the profession recognize the fact that a further sub-division would be a calamity, and that even some of those already in existence should revert to the general practitioner, whence they sprung.

In the final analysis, dental service is on a par with the bulk of commercial commodities. It is a question, not only of supply and demand, but a question of the excellence of the thing purchased. The whole world knows to-day the value of mouth hygiene, as well as the value and importance of a well-kept set of natural teeth. Because of this knowledge, those who can pay for dental service are going to have that service from the man who can render service of the highest standard, and that, in many cases, regardless of the fee that may be charged.

The important thing for each one of us to consider is this: Am I capable of rendering to my patients as good service in the field in which many men are now calling themselves specialists as are the so-called specialists, or, if I am to be honest with these patients, must I send them to some other man, conscious that they will receive a standard of service which I cannot personally give to them? The whole question resolves itself into two points — personality and efficiency. I thank you. (Applause.)

An interesting discussion followed the reading of Dr. Thornton's paper, in which the following members of the Society took part: Drs. M. G. McIlhenny, C. H. Juvet, Oliver Martin, Sydney W. Bradley, E. W. Oliver, S. Davidson, M. F. Cross.

American Institute of Dental Teachers

THE next annual meeting of the American Institute of Dental Teachers will be held at the Claypool Hotel, Indianapolis, Ind., January 24th, 25th and 26th, 1921.

The program will contain much of interest in dental teaching methods and dental educational affairs. A cordial invitation is extended to all ethical practitioners and others interested along these lines to attend the sessions.

Dr. Arthur D. Black, President.
Dr. Abram Hoffman, Secretary.
381 Linwood, Ave., Buffalo, N.Y.

Chicago Dental Society Annual Clinic and Mouth Hygiene Meeting

CONGRESS HOTEL, *January* 27-28-29, 1921.

THURSDAY.

TWELVE unit and lectures clinics for intensive study. Clinics to be given by lecture, lantern slides, charts, models, and table demonstration. Most clinics to occupy both morning and afternoon session, so that guests will only be able to see one entire clinic or two half day clinics. Each clinic in separate rooms, and limited to 100 in attendance.

8 P.M. PAPER.

"Focal Infection in Relation to General Health," by Ernest E. Irons, M.D., Professor of Medicine, Rush Medical College, Chicago.

FRIDAY, MOUTH HYGIENE DAY.

Demonstrating care of children's teeth by dental hygienists from six infirmaries. Clinics showing results of public school service and industrial institution service. Motion pictures. Public meeting. Nationally known speakers. Annual banquet in honor of Thomas Alexander Forsythe, Boston, Mass.

SATURDAY—GENERAL CLINIC.

Selected from 35 neighboring states and district societies. By dental colleges represented at annual meeting of Institute of Dental Teachers. By fifty local dentists on advanced methods of technical procedure. Manufacturers' exhibit.

THE Dentists of Edmonton occasionally take an hour or two off to play golf or shoot ducks or chickens.

The above snapshot shows the result of a two-hour shoot by "Bob" Decker and "Mort" McIntyre, within an hour's motor ride of the City of Edmonton. "Seventy-two—and nearly all big ones."

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

Dentists and Life Insurance.

RECENT statistics show that the average span of life for dentists is 45 years, and for ministers 68 years. If it is true that the good die young, then we should occupy the very front seats in the halls of St. Peter, while the gentlemen of the cloth will be given standing room only, way back in the rear.

There is still another reward for us. The minister continues to pay the premium long after the dentist's family has cashed in on his insurance policy. This brings another thought to mind. If a man dies young he is more likely to leave behind him dependents of tender age who cannot yet take care of themselves, and therefore he needs more insurance. For the same reason insurance is a good investment for us, because our families withdraw more than the premiums we paid in. The long-living fellows make up the deficiency. —*American Dentist.*

The Translucent Filling Cement.

The problems which confront an investigator of dental cements are many, and among these two stand out as being of more than usual importance. The problems are these: What are the end products formed when the cement is fixed in the cavity, and is there any chemical or physical factor in the end product which is likely to have an adverse effect upon a live tooth pulp?

In considering filling materials, apart from metallic filling such as gold and amalgam, there remains at the one extreme the oxy-phosphate cements, and at the other the porcelain fillings obtained by fusion of aluminum and silicates, in an electric furnace. The synthetic fillings represent a compromise between these extremes; an attempt to combine the tooth-like lustre of the aluminum and silica with the ease of manipulation and adhesiveness of a cement. The translucent fillings are those which are made by combining aluminum or other acid phosphates in solution with various bases. Most of these cements, upon analysis, show a considerable portion of water, acid phosphates in solution, and free phosphoric acid which is included to initiate the chemical interaction of the powder and the liquid, and to hasten the period of setting.

The reaction between the powder and the liquid is probably as follows: The phosphoric acid reacts with the powder producing acid phosphates of aluminum and any other bases, such as calcium, which may be present. These acid phosphates react with the powder forming normal phosphates of aluminum and other bases and water, some of the water freed by the decomposition of the phosphoric acid reacts with the reduced silicon oxide and hydrates it. There appears to be a real danger in the possible presence of an acid reacting substance in the mixed cement, when and after it is inserted in the cavity. Experiments carried on showed that fillings of silicate cement had an acid reaction to litmus paper, and this condition continued for some time after the setting process was complete. It was further determined that oxyphosphate of zinc cements are acid when inserted into the tooth cavity. In the case of zinc, however, the interaction of the powder and the liquid takes place fairly quickly, so that at the end of a short time the acid reaction goes. The zinc powders react rapidly and completely with the acid liquids. Aluminum, on the contrary, is chemically inert, and the reaction of its compounds with the liquids is slow, so that the mixed filling remains acid for a long time. If this acid reaction continues over a long time, as it seems to do with most translucent fillings, then it is likely to lead to the death of the pulp if the cavity is deep and the filling near to that tissue. If the liquid and powder are not thoroughly spatulated together a relatively large quantity of uncombined liquid will remain in the set filling, thus accounting for its increased acidity and also rendering it much more liable to disintegration by the fluids of the mouth; the probability of the latter occurrence is obviously largely increased where the filling is allowed to become moist within the ten minutes necessary for the primary setting.

There is another possibility of danger to the pulp in that the silicate fillings transmit thermal shock to the pulp very liberally. This may occur either because of leakage at the margin of the filling, or by the conductivity of the mass of the set filling. One of the most noticeable disadvantages of the silicate filling is that of discoloration. Aluminum salts are mordant dyes, and as such are used for fixing stains in the process of calico printing. It seems probable that, acting in this way, they may fix organic stains which come in contact with them, such, for example, as the red coloring matter in carbolic tooth pastes.—*F. N. Doubleday, M.R.C.S., L.D.S., in The Dental Record.*

Dental Activities in Chicago

OCTOBER and November were busy months with the profession in Chicago. The Odontological Society met November 9th as the guest of the retiring President, Dr. Truman W. Brophy, and listened to a paper by Dr. Brophy dealing with the prevalent tendencies toward the radical extraction of teeth. The essayist paid his respects in no uncertain manner to those members of the medical profession who order the extraction of teeth without due deliberation, merely on the suspicion that they may be at fault. He argued for a more thorough training of the medical student in oral pathology, claiming that if the medical schools taught this subject as it should be taught, it would lead to a more intelligent attitude toward mouth conditions on the part of medical practitioners, and a better understanding between physicians and dentists.

The fact is that there has existed for a long time an urgent need for a closer co-operation between medical men and dentists, to the end that each may get a broader vision of what the other is trying to accomplish, and thus be able to profit in a way that shall result in better service to the patient. This conviction seems to be growing, and the future will witness more frequent consultation between the two, and an altogether better relationship.

The component societies of the Chicago Dental Society held some live and interesting meetings, and each instituted a drive for new members. As stated in a previous communication the society now has a membership of about 1700 and the slogan has gone up for "500 new members." There is a delightful little rivalry between the different component societies for the most interesting and well-attended meetings, and the largest addition to the membership. The officers of the parent body are watching the contest with much interest.

The November meeting of the Chicago Dental Society had as essayist Dr. T. W. Maves, of Minneapolis, Minn. The subject was: "Preparation of vital teeth for bridge abutments, the technique of porcelain tipped dummies and porcelain implantations, together with a few principles in casting." This comprehensive title was admirably handled, and the essayist lived up to the statement made by the program committee in announcing the meeting, which was as follows: "Dr. Maves believes in pulp conservation, and has worked out methods which require less cutting away of tooth structure for abutment preparation than other teachers of crown and bridge technic, and thereby causes only a minimum amount of pulp disturbance in this work."

It must be noted by every observant practitioner that there is a growing tendency on the part of the profession to avoid pulp destruction wherever possible. The altogether routine and off-hand manner in which pulps have been destroyed in the past will no longer pass muster for good dentistry, and while the methods of pulp canal filling have been greatly improved, yet there is no filling for the canal of a tooth that can in any way equal a good healthy pulp itself.

The meetings of the Chicago Dental Society are held on the third Tuesday of each month and there is always a most hearty welcome for visitors from out of the city. At the December meeting we are to have a paper by Dr. Clarence O. Simpson, of St. Louis, on the proper interpretation of the X-ray, and this is a subject which should bring out a bumper attendance. No topic before the profession today is of greater importance than this and no man is more capable of discussing it than Dr. Simpson. I wish all my Canadian friends could be present. Happy New Year!

C. N. Johnson

Toronto Dental Society

AT the opening meeting of The Toronto Dental Society, the President, Dr. W. H. Coon, referred to the opportunities and responsibilities of Canadians, and urged upon all of the members of the Society that they prove themselves worthy of the same.

Reference was made to the rapid strides which the Dental Profession had made during the past few years, and to the many qualities which must be possessed by the successful Dental practitioner. Dr. Coon urged that attendance at Society meetings is essential, and asked the members to loyally support the efforts of the officers in building up a strong organization. It was suggested that every member bring at least one other member of the Profession to the next meeting of the Society.

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EDITORIAL

Government Exempts Dentists From Sales Tax

DR. E. A. GRANT, Secretary of The Canadian Dental Association, has received intimation from the Commissioner of Taxation, Ottawa, that on the 23rd of November, 1920, an order-in-council was passed, under which prosthetic work carried on in a dental office is exempt from the Sales Tax.

This ruling does not appear to affect Prosthetic Laboratory men who are proprietors of laboratories and accept work from dentists. Such laboratory men will be called upon to pay the manufacturers' tax as heretofore.

The Executive of The Canadian Dental Association had made arrangements for a delegation representing the different provinces of the Dominion, to discuss the whole question with the Minister of Finance in Ottawa, but the above ruling makes such a delegation unnecessary.

The Government is to be complimented upon its prompt action in regard to the application of this tax to the Profession of Dentistry. We believe that it was never the intention of the Government that such tax should apply to the members of any Profession, but the over-zealous action of Deputies and local Inland Revenue Officers forced the matter upon the attention of the Government. The Inland Revenue Department will doubtless notify local officers in due course regarding the interpretation of the regulations of the Department in their application to Dentistry.

Why Members of the Dental Profession Cannot and Should not be Classed as Manufacturers

DR. R. G. McLaughlin, Contributing Editor of *Oral Health*, and Professor of Ethics and Jurisprudence of The Royal College of Dental Surgeons, was invited to prepare a statement showing the essential difference between a business and a profession, and particularly regarding the right of local excise officers to ask members of the Dental Profession to pay a 2% tax upon prosthetic or other Dental appliances made in their offices and essential to the service rendered their patients.

The statement prepared by Dr. McLaughlin is of such general interest to the Profession, that we publish the greater part of it in full:

"The accepted legal definition of a business man is one who is engaged in exchanging commodities for other commodities or for money. He is engaged in the work of buying and selling.

"A profession is a special calling which only those are allowed to follow who have conformed to a prescribed course of education and training, have passed successfully the necessary or prescribed examinations, are of good moral character, and have finally been licensed by special statute to practise in that profession.

"The law, as you see, draws a very clear line both legally and ethically between a business and a profession. The business man cannot cross the line into the ranks of a profession, unless he first conforms to the legal requirements governing that profession; and the professional man cannot commercialize the practice of his profession with impunity. He would be found guilty of unprofessional conduct, and liable to have his license suspended or revoked.

"The relation of a Dental Surgeon to his patient is not that of a seller and buyer, nor that of employer and employee; it is a trust of the utmost importance confided to the Dentist by his patient, who entrusts his future comfort and health, and not infrequently life itself, to the professional knowledge, skill, good judgment and sincerity of the dentist. The patient does not come as a buyer, seeking to purchase something the Dentist has to sell. . . . . . . He is sick and suffering from the diseased condition in the oral cavity or that region, and he comes to the Dentist for professional advice and services. He legally expects from the Dentist, as a professional man, the necessary professional knowledge and skill to diagnose his trouble and prescribe the proper remedies, whether they be medicinal, surgical, mechanical, advisory, or all four combined.

We must understand that Dentistry and Medicine are sister professions. We are engaged in the same great work of caring for the health and physical welfare of the public. As surgeons treating different parts of the same body, and restoring lost or damaged parts of the human anatomy—whether it be a lost eye, a lost tooth, a lost nose or a damaged arm,—we are governed by the same ethical customs and legal rulings.

"If you class as a manufacturer the Dental Surgeon who replaces a lost or damaged tooth by an artificial one, then by the same reasoning the Surgeon who replaces a lost eye by an artificial one, who makes a splint to bind up a broken bone, or who makes up a box of pills, must be classed as a manufacturer. In short, the Dental Surgeon and the General Surgeon are ethically and legally on the same plane, and such a ruling as proposed applies to the one with the same force as it does to the other.

"In short we must answer this question: Can a member of a profession which has been organized by special statute, and its membership rigidly restricted to those who have won their diplomas by a long, arduous course of study,—can a legally qualified member of that profession—be he a Dental Surgeon or a General Surgeon—while strictly following the practice of his profession, be legally called a manufacturer or a tradesman?

"The Supreme Court of Mississippi was asked to pass upon this point: the question before the Court was whether a Dentist's instruments were exempt from execution under a statute exempting the tools of a mechanic necessary for the carrying on of his trade. The Court said: 'We do not think that this provision can be extended to the description of instruments in question. A Dentist cannot be properly denominated a mechanic.'

"From the time of Federation, when the British North America Act gave each province control of its own educational matters, every precaution has been taken in Ontario, by amendments and additions to the Dental Act, and by special by-laws, to prevent members of the Profession from commercializing the practice of Dentistry. Such restrictions and precautions were considered necessary in the public interest. It would be considered a misdemeanor today for any member of the Dental Profession in Ontario to so practise his profession or conduct his practice as a commercial concern. Some years ago, in the City of Toronto, an attempt was made to commercialize the Profession by ordinary laymen establishing concerns known as Dental Parlors, etc., and hiring licensed Dentists by the day or week to work for the patients. This matter was taken to the Court, and the decision and opinion of Chief Justice Anglin is worthy of notice."

Official Communication, Department of Health

THE Department of Health some weeks ago mailed to all physicians, veterinary surgeons, dentists and druggists in Canada, form No. 6, on which to make the declaration as provided under the Act, showing that they are engaged in the sale or distribution of narcotics

Very heavy penalties are provided under the Act for neglecting or refusing to furnish the declaration in question; a fine of not less than $200.00 and costs, and not more than $1,000.00 and costs, or to a term of imprisonment of one year, or to both fine and imprisonment, being the penalities specified for non-compliance with the regulations.

As a number of physicians, veterinary surgeons, dentists and druggists have not so far sent in the required declaration, the Department has advised the Editor that unless this declaration is received within a reasonable period, the law will be enforced and penalties levied upon all delinquents.

It should be noted that all physicians who obtain narcotics in any quantity to administer directly to their patients, are considered to be engaged in the distribution of these drugs; likewise all dentists and veterinary surgeons who obtain supplies of these drugs for use in connection with their practice, are considered to be engaged in the distribution of narcotics, and it is, therefore, necessary for them to make the declaration as required under the Act as amended at the last session of Parliament.

Any physician, veterinary surgeon, dentist or druggist who may have mislaid the forms sent by the Department, may upon application to the Department of Health at Ottawa, obtain further copies in order that the necessary declaration may be filed.

The Department of Health does not wish to work any hardship in connection with the filing of these declarations, but in order that the law as embodied in the Act, be conformed with, any physician, veterinary surgeon, dentist or druggist failing to fill in the forms of declaration within a reasonable time, will be dealt with according to the terms set forth in the Act.

Dental Office Suite, newly planned and decorated, and ready for occupation is available at 151 Bloor St. West, (near Avenue Road), Toronto.

Request For Extracted Teeth

THE students and staff of the Royal College of Dental Surgeons will greatly appreciate the co-operation of the profession in forwarding to the College, 240 College St., Toronto, extracted teeth that have not been badly broken down by decay

This book must be returned to the Dental Library by the last date stamped below. It may be renewed if there is no reservation for it.

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